SCIENCE FICTION

analog

SCIENCE FACT®

AUGUST 1979 $1.25

HE
ANDED
NTERESTS
am Nicholson

ochrane
OSMOLOGY

08
753314

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

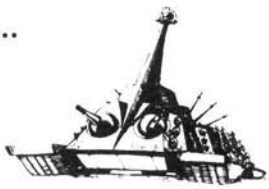
SCIENCE FICTION GAMES

Metagaming's MicroGames are small, fast-playing, and inexpensive. But not trivial. A MicroGame is classic wargame — that you can put in your pocket and play over lunch.

It won't take you all day to learn the rules — or all night to play. But each one is challenging — and fun MORE play for LESS money? Try a MicroGame and see.

MicroGame 1...

OGRE

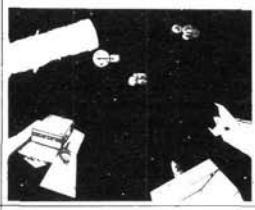


$2.95 — $2.50 for The Space Gamer subscribers.

The OGRE is a robotic tank — 30 meters long, armed with nuclear weapons, incredibly tough, and inhumanly intelligent. This fast-moving game pits *one* Ogre against a force of "conventional" tanks, infantry and hovercraft in the year 2085. It's an even match . . .

MicroGame 13...

HOLY WAR



Amtik the g
had a proble
His creation
the men who lived inside
400,000-km-long body - w
fighting. And the battle co
destroy him . . .

HOLY WAR, by the
signer of GODSFIRE, is a
combat game for two playe
with a unique backgrou
and victory conditions. $2
— $2.50 for TSG subscribe

MicroGame 10...

BLACK HOLE

The artifact killed Winch Dunkin before he knew what he'd found. Later explorers were more careful . . .

BLACK HOLE is a battle for possession of an alien station . . . a ring-shaped asteroid with a black hole in the middle! Players must avoid the deathtrap in the center, their opponent's missiles . . . and their OWN. Miss your target, and the shot will orbit until it hits SOMETHING . . . *$2.95 — $2.50 to TSG subscribers.*

MicroGame 7...

The Webbies have taken over Mars — and Earth will be next, unless a daring U.N. raid can crack the Martian tunnels and steal the secret of the WebMind. A challenging tactical game from the designer of GODSFIRE. *$2.95, or $2.50 to TSG subscribers.*

OLYMPICA

MicroGame 12...

INVASION of the AIR-EATERS

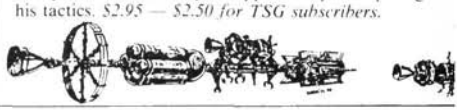
It's your favorite pulp fantasy come to life. Creatures from Outer Space have landed. Their inhuman plan: to turn our atmosphere into their own poisonous sludge.

Alien machines battle the combined armies of Earth on a map representing the whole world. *$2.95 — $2.50 for The Space Gamer subscribers.*

MicroGame 4...

WARPWAR

A game of interstellar maneuver and tactical combat. Players design their own ships — each with its own offensive, defensive, and movement capabilities — and battle with a unique *diceless* combat system. To win, you must *outguess* your opponent by anticipating his tactics. *$2.95 — $2.50 for TSG subscribers.*



Please send me the following games. I have enclosed $2.95 per game ($2.50 for The Space Gamer subscribers), plus 50 cents for postage.

If you're not already subscribing to The Space Gamer, Metagaming's magazine for the science fiction and fantasy game fan, why not do it now? Starting immediately – and for as long as you subscribe – you'll get discount prices on all Metagaming products. And TSG brings you game articles, variants, fiction, and more!

Subscribe today. One year (6 issues) costs $8. Two years (12 issues) costs $15.

.....OGRE .....BLACK HOLE .....AIR EATERS .....HOLY WAR .....OLYMPICA .....WARPWAR ..... years TSG

Name..... Address..... State..... Zip.....

Metagaming

Box 15346-AS
Austin, TX 7876

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

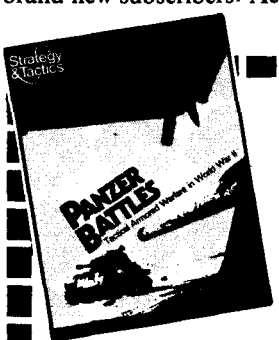
Subscribe now to STRATEGY & TACTICS and get a FREE GAME

SPI, the world's largest publisher of historical simulation games, wants you to subscribe to **Strategy & Tactics**—a fascinating and authoritative bi-monthly magazine of military history. Because we're confident that exposure to **Strategy & Tactics** and simulation gaming will be the beginning of a long-term customer and reader relationship with SPI, we'd like to give you a free, full-fledged simulation game to start you off (see description at right). Moreover, **Strategy & Tactics** itself has a simulation game in *every* issue (as a companion piece to its main article) so you'll get a new game as part of each issue in your subscription. **Strategy & Tactics** and SPI games are a fresh and exciting way to gain insights into the great conflicts of history. This offer is open only to brand new subscribers. Act now!

With the first issue of your new subscription to *S&T* we'll send you a free copy of *StarGate,* an action-filled game of intergalactic conflict. As the Virunian oppressors, tyrants of the Milky Way, return home in tatters from a conflict in another galaxy, they are pounced upon by the long down-trodden races who rise in rebellion. Includes fewer than 100 cardboard playing pieces (for easy playability), 11" × 17" map, and complete rules, all folding to a handy 5½ × 8½ size that slips into a re-usable plastic envelope.

Game normally sells for $3.95

it's yours FREE
for subscribing to *S&T*!



Send check or money order to:

SPI Dept. 1070
257 Park Ave. South, New York, N.Y. 10010

Send me my free game and enter my S&T sub for:

☐ 1 yr. (6 issues) $16 ☐ 2 yrs. $30 ☐ 3 yrs. $42

name _____

street _____ *apt#* _____

city _____ *state* _____ *zip* _____

FOREIGN ORDERS: Add 20% handling charges. Payment must be by Postal Money order (in US funds) or by check drawn against US bank.

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

CONTENTS

STANLEY SCHMIDT
Editor
ED PELLEGRINI
Associate Editor
COLLEEN PRESTON
Editorial Assistant
HERBERT S. STOLTZ
Art Director
GERALDINE PRASIOTIS
Advertising Production Manager

Next Issue on Sale
August 7, 1979
$10.00 per year in the U.S.A.
$1.25 per copy

Cover by John Sanchez

Vol. XCVIX No. 8
AUGUST 1979

SCIENCE FICTION
analog®
SCIENCE FACT

novelette

THE LANDED INTERESTS, Sam Nicholson **10**

science fact

ANTIMATTER IN THE UNIVERSE, John G. Cramer **53**
IS THE UNIVERSE A YO-YO?, Thomas A. Easton **47**

short stories

giANTS, Edward Bryant **68**
HOME IS THE HUNTER, Stephen Tall **142**

serial

CLASS SIX CLIMB, Part Three of Three Parts, William E. Cochrane **84**

reader's departments

THE EDITOR'S PAGE **5**
IN TIMES TO COME **163**
THE ANALOG CALENDAR OF UPCOMING EVENTS **161**
THE ALTERNATE VIEW **158**
MOVIE REVIEW . . . **164**
BIOLOG . . . **157**
THE REFERENCE LIBRARY, Edward Wood **169**
BRASS TACKS **174**

Analog Science Fiction/Science Fact is published monthly by The Condé Nast Publications Inc., Condé Nast Building, 350 Madison Avenue, New York NY 10017. S.I. Newhouse, Jr., Chairman, Robert L. Lapham, President, Fred C. Thormann, Secretary-Treasurer.
Second class postage paid at New York, N.Y. and at additional mailing offices. Subscriptions in U.S. and possessions, $10.00 for one year, $18.00 for two years, $25.00 for three years. In Canada and Mexico, $12.00 for one year, $22.00 for two years, $31.00 for three years. Elsewhere $13.00 per year, payable in advance.
Single copies in U.S., possessions and Canada, $1.25. For subscriptions, address changes and adjustments, write to Analog Science Fiction/Science Fact, Box 5205, Boulder CO 80323. Eight weeks are required for change of address. Please give both new and old address as printed on the last label. Postmaster: Send form 3579 to Analog, Box 5205, Boulder CO 80323. First copy of new subscription will be mailed within eight weeks after receipt of order. The editorial contents have not been published before, are protected by copyright and cannot be reprinted without the publisher's permission. All stories in this magazine are fiction. No actual persons are designated by name or character. Any similarity is coincidental. We cannot accept responsibility for unsolicited manuscripts or art work. Any material submitted must include return postage.
COPYRIGHT © 1979 BY THE CONDÉ NAST PUBLICATIONS INC. ALL RIGHTS RESERVED. PRINTED IN THE UNITED STATES OF AMERICA.
POSTMASTER: SEND FORM 3579 to ANALOG SCIENCE FICTION/SCIENCE FACT, BOX 5205, BOULDER CO 80323

ISSN 0161—2328

Editorial and Advertising offices, Condé Nast Building 350 Madison Avenue New York NY 10017

Subscriptions: Analog Science Fiction/Science Fact, Box 5205 Boulder CO 80323

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

EQUAL RIGHTS FOR DUMB BLONDES

Well, it got your attention, didn't it?

Please read on, though; I'm probably not talking about what you may think. I'm certainly not suggesting, for example, that all, most, or typical women are "dumb blondes," or that their rights are in question. (Why did you assume I meant dumb blonde *women,* anyway?) Nor am I suggesting that the stupid or ignorant should have equal rights in all matters with the intelligent and informed. I suspect, for example, that there's something to be said for the idea that people making decision about nuclear power plants or research funding should have to know something about those subject—but that's another editorial. (At least.)

What I'm speaking of here is a recent trend—a sort of "reverse discrimination," to borrow the popular jargon—I've recently noticed in some literary circles. Literary circles, of course, are only ripples on a larger pond, but the way they move tells something about the pond itself. These particular ripples are disturbing, at least to some of us directly concerned with writing and publishing.

The direct spur to this writing was a small number of letters protesting the alleged anti-Semitism in a recent Analog story. (The story, by the way, was one bought before I arrived, so I am not making these remarks in self-defense.) The basis for the claim? The story in question contained a character who was (a) Jewish, and (b) not so nice.

This is anti-Semitism? With all due respect, doesn't the accusation seem just a wee bit far-fetched?

The incident called up echoes from my own not-so-distant past. I wrote a novel containing a character named Franz Gerber who was (a) German, and (b) not the wisest fellow in the world. Being in a position of great influence, he made some mistakes which were rough on a lot of other people, and made him look like something less than the epitome of All That Is Noble.

At least one reader asked me, with

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

some hint of accusation: why did you make him German?

Look . . . he had to be *something*. And he was onstage a lot, so it was preferable that he be something that I knew well enough to flesh out with some confidence. Since I knew more of the German language and culture than of many others, that was at least as good a choice as any. My motives were no more sinsiter than that. (I might add parenthetically that his weren't, either. He was not an evil man; he conscientiously did the best he could, according to his understanding of the situation. But that has no relevance to the point I'm building toward. Even if he *had* been out-and-out evil, I would defend my right to write about him—as a German or anything else.)

I've known writers who received hate mail because they depicted a woman as a weak or dependent person —or even as a competent and contested housewife and mother who didn't aspire to being anything else.

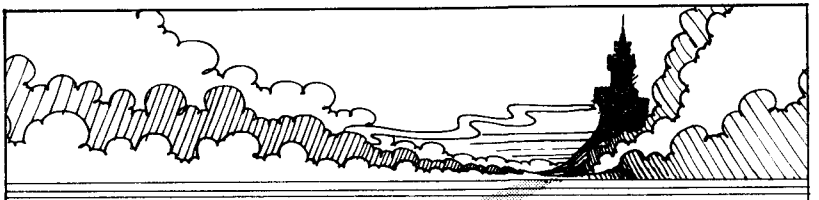
A few years ago, a publishing company which shall remain nameless (partly because I really don't remember which one it was) announced as policy that, in the fiction it published, members of minorities should be shown in "important" roles (meaning bank presidents, doctors, etc.) in numbers commensurate with their actual numbers. *Not* their actual numbers in those roles, mind you, but their actual numbers in the general populace. This announcement created enough furor among writers who didn't care to have their books cast for them that I think it died relatively quietly, but it was an interesting concept. Having 50% of all the people in any occupation be women and 12.5% be black may (or may not) be a nice goal for the future, but it aint here yet, folks—and it hasn't been at any time in the past, to my knowledge. So how could this publishing policy be reconciled with the needs of a writer who wants to write realistically about the way things are *now*—or how they got that way? (Or how they might develop in some *less* desirable futures?) Suppose his central theme is an exploration of *why* those percentages aren't realistic now—of the social problems which have so far kept certain groups in statistically disadvantaged positions.

Imagine, for instance, a writer trying to examine why so few blacks are college professors—in a story in which, by Publisher's Decree, many blacks *are* college professors. His story is not allowed to portray the very situation he's supposedly writing about!

If that isn't censorship by the back door—what is?

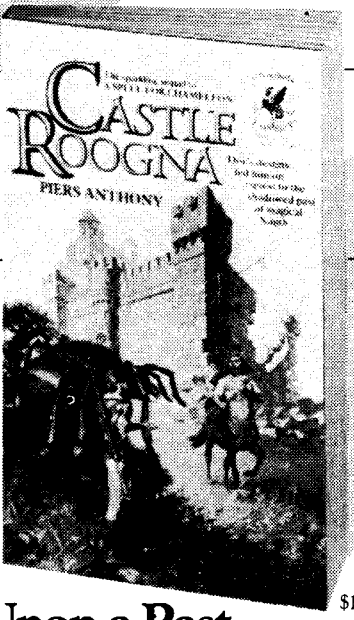
Consider a related problem: that of getting more black performers into theatrical roles. A fine thing, generally—in roles in which race is not an issue. Fortunately there are enough such roles, and enough possibilities for creating more, to continue greatly expanding the opportunities of black actors. But, please, not with quotas or any other such

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED



DEL REY

#1 Publisher
of Science Fiction
and Fantasy.



$1.95

Once Upon a Past...

Volume III in Piers Anthony's enchanting trilogy, **The Magic of Xanth**

Following the success of **A Spell for Chameleon** (Selected by the British Fantasy Society as Best Novel of the Year 1977) and **The Source of Magic** (a national bestseller) comes this beguiling tale of an under-age magician and his quest for maturity and a mate.

Dor's ability to converse with inanimate objects has him constantly in hot water. Somewhere, somehow, somewhen, he'll have to learn to manage his troublesome talent—and the building of Castle Roogna in Xanth's shadowy past provides just the opportunity.

Ballantine Books
A DIVISION OF RANDOM HOUSE, INC.

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

arbitrary criteria. We have to recognize that through a great deal of history—and we're not free of it yet, much as we might like to be—race *has* been an issue, and it makes no sense to pretend that that fact doesn't exist in a drama dealing *with* that issue and its ramifications. Casting a black man as Abraham Lincoln is ludicrous.

So is a white man as Martin Luther King. Or *Roots* with an 87.5% white cast (to reflect the white population of the present, general, local population).

Care to try *Guess Who's Coming to Dinner* with an all-black or all-white cast? Nobody could make head or tail of it. (We can hope that people sometime in the future will find it incomprehensible even with the right cast—but that, I fear, is a long way off.)

My basic point is that trying to dictate how the members of any category of people can be used in literature or art is dangerous, striking at the very things which are the essence of literature and art. That regulation is just as dangerous whether it's done by official edict of a publisher or by fashionable prejudices of readers. Writers of fiction and drama cannot work effectively if they are told that they must observe racial, sexual, religious, or otherwise ethnic quotas in their work.

Or if readers insist on interpreting an unfavorable (or favorable portrayal of a member of any group as representing the author's attitude toward that group as a whole. Whether there is a special reason why the cast must have a particular composition, as in the examples above, is not, in general, important.

Let's return to my original example.

Every one of us belongs to not one, but *many* groups, and every one of those groups includes individuals spanning the whole spectrum of human characteristics. I *have* known greedy and scheming Jews—and that fact is independent of, and irrelevant to, the fact that I have also known many who were otherwise. I have known people very much like the classic Dumb Blonde Secretary stereotype—just as I have known smart blondes, dumb brunettes, smart brunettes, mediocre redheads, etc., *ad nauseam*.

All these kinds of people do exist. All are fair game for writers. I certainly wouldn't want to read a steady diet of stereotypes (as an editor reading unsolicited manuscripts, I probably come closer in practice than most people would care to), but I insist on the right of any writer to use any types of characters his stories need, *including* those close to stereotypes—favorable or un.

Otherwise, writing will become sterile and anemic, afraid to do or say any but the blandest of things for fear of offending somebody. (As an editor, incidentally, with nearly all reader feedback crossing my desk, I can assure you that virtually *anything* will offend *somebody*.) If every unlikable Jewish character is taken as an attack on all Jews, if every in-

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

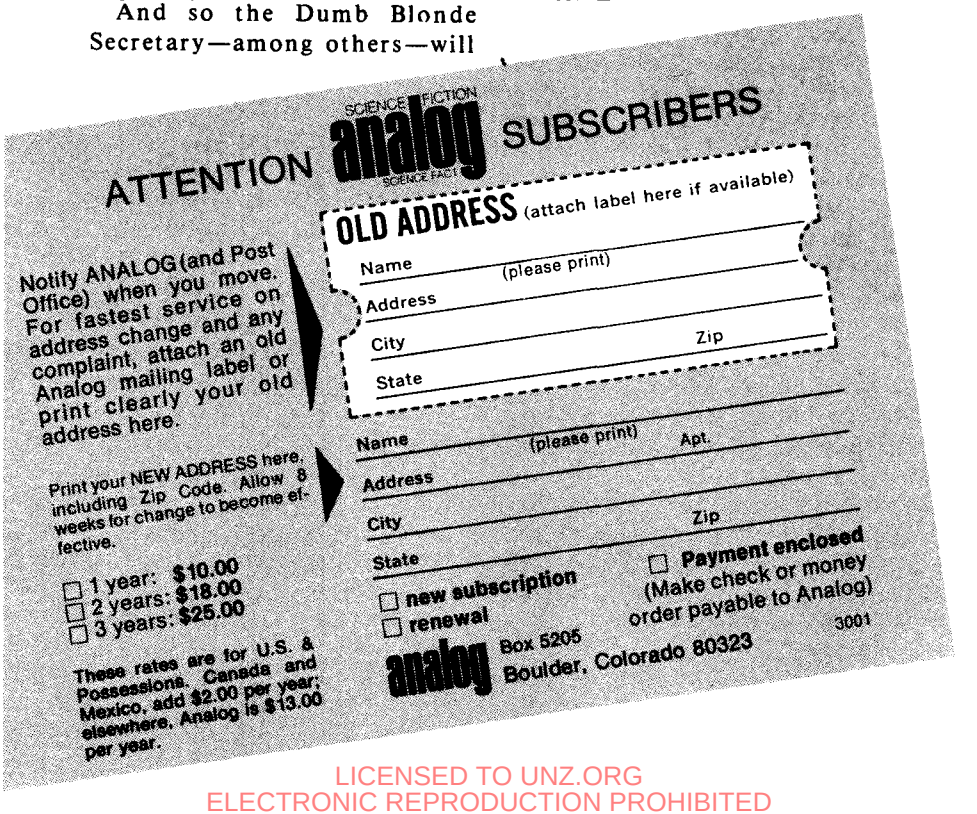
competent female character is taken as an attack on all women, stories will come to be set in a most remarkable, glossy unrealistic fairyland, populated by an odd mix of people bearing little resemblance to the mix we actually live among. Such a mix, diligently avoiding anything resembling an old stereotype, bears as little relation to reality as the often and justly criticized mixes containing *only* those stereotypes. In this new, fanciful world, carrying this current trend to a logical extreme, there will be no villains. No writer would dare—for every villain would have to belong to several groups, and we wouldn't want to reflect unfavorably on any of them. Would we?

And so the Dumb Blonde Secretary—among others—will vanish from the pages of the Earth. This, I submit, is blatant discrimination! Are we to deny a whole group of our fellow persons their place in literature? Surely (I hope) not! *All* kinds of people deserve to be written about—not just those who happen not to offend anybody this season.

Hence my call for equal rights—equal rights to appear in print and on stage, screen, and television—for dumb blondes.

As well as blazingly brilliant blondes, black woman presidents and black shoeshine boys, housewives both contented and rebellious, Italian hoodlums, composers, and physicists, Martian bartenders . . . .

Etc. ■


ATTENTION
SCIENCE FICTION analog SCIENCE FACT
SUBSCRIBERS
Notify ANALOG (and Post Office) when you move. For fastest service on address change and any complaint, attach an old Analog mailing label or print clearly your old address here.
OLD ADDRESS (attach label here if available)
Name (please print)
Address
City Zip
State
Print your NEW ADDRESS here, including Zip Code. Allow 8 weeks for change to become effective.
Name (please print) Apt.
Address
City Zip
State
☐ 1 year: $10.00
☐ 2 years: $18.00
☐ 3 years: $25.00
These rates are for U.S. & Possessions. Canada and Mexico, add $2.00 per year; elsewhere, Analog is $13.00 per year.
☐ new subscription
☐ renewal
☐ Payment enclosed (Make check or money order payable to Analog)
analog Box 5205 Boulder, Colorado 80323
3001

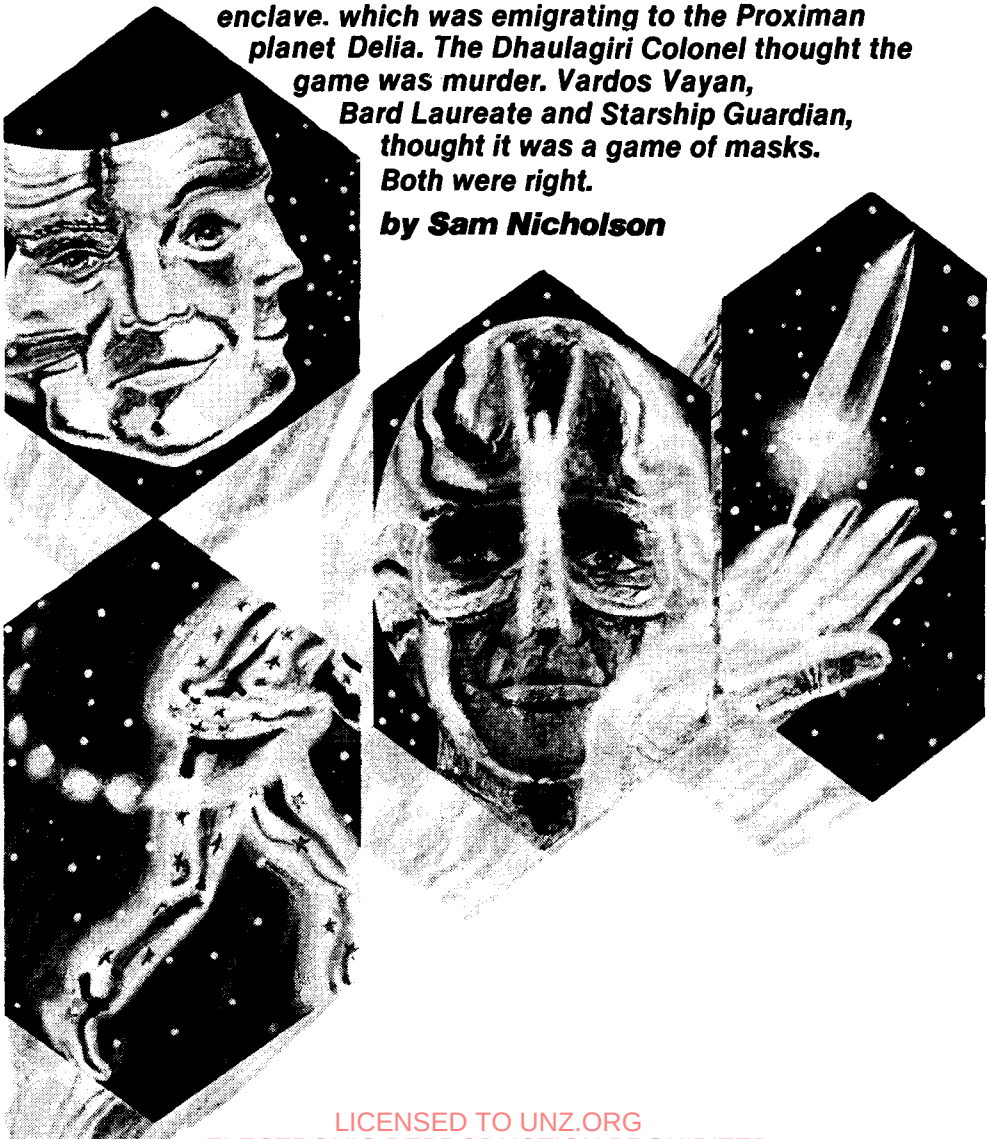
LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

the landed interests

An anonymous crackpot among a thousand starship passengers was playing a game with the Bonmanist enclave. which was emigrating to the Proximan planet Delia. The Dhaulagiri Colonel thought the game was murder. Vardos Vayan, Bard Laureate and Starship Guardian, thought it was a game of masks. Both were right.

by Sam Nicholson



LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

The Bard Laureate's troupe had concluded their repertory season, winding it up magnificently under the Pleasure Dome of the Asteroid planet Vesta. Among the Players, feelings were mixed. The Bard himself—the quiet-mannered but vividly handsome Vardos Vayan—was in high spirits. Once more he would be going into space, as befitted the Star Bard.

Waystation Two, the first giant step along the circuit to the Proxima planets (and hence called Trail Blazer) would be celebrating its Centennial in the next Earth year, and Vardos intended to be there with bells on.

However, Waystation Two was six months out from Sol and Waystation One at Vesta. Six months out—six months back. The Players, aware of what they owed the Bard's inspired direction, were depressed at losing his services for the next full year.

The Bard's manager, the sartorially elegant but perpetually insolvent George Apfelstein, was optimistic. During the months in space, his valuable client could write another dramatic epic—another financial success like the *Waystation Trilogy* which had won Vardos the Laureate.

Meanwhile on Earth, in the Security office of the starship launch-track atop Mount Dhaulagiri in the Himalayas, a certain Colonel was frowning over a summation pad. He rubbed his blunt chin, harrumphed, and pressed a button on his desk audio. A crisp voice responded immediately. "Expediting office. Simpson."

"Simpson, where's our iambic-spouting starship Guardian?" barked the colonel.

"The Bard Laureate, sir? Why, he's on Vesta. In a week, he's boarding a Centennial tourship—"

"That's what *he* thinks. Get him back here instanter. I want him on the express lift-out, day after tomorrow."

"I don't understand, Colonel. There's no transportation from Vesta today—and the Bard could just as well pick up the express starship at Waystation One."

"He might be picking up a flock of corpses by the time the starship got to Vesta! I want him aboard at lift-out! Send a tachyon-Morse message to the Vestan Patrol. They can relay him to the Moon tomorrow."

"But the Moon-Earth traffic jam takes eighteen hours, sir!"

"This is Top Priority, dammit! An official Moonbat can jump the helix and bring the Bard here in a couple hours. On your toes, Simpson! Expedite! Expedite!" Without waiting for Simpson's reply, the Colonel clicked off the desk audio abruptly.

Not even Top Priority could expedite Vardos to Earth at the Colonel's impatient rate. The express starship was two hours short of countdown at Dhaulagiri when Vardos strolled into the Security office and greeted the Colonel, who looked at him and winced.

Vardos, hustled away from Vesta, perforce had to bring along the wardrobe intended for the merrymaking aboard the Centennial tourship. He was now wearing a white jumpsuit

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

spangled with tiny gold stars, his Sol/Proxima Dual Citizen badge a rosette-circled ornament on his chest.

"Sit down," grunted the Colonel. "I see I guessed wrong."

"Oh? About what, Colonel?" smiled Vardos, settling into the indicated chair.

"I thought you wouldn't give a damn how you got to Trail Blazer—tourship or express. But the circus-rig you've got on—!"

"Cheerful, don't you think? I'm saving my pinwheel-stripe for arrival. Seriously, Colonel, what's the job? How long will it take? I've retained my tourship accommodations. I hope I'm not really in for six months aboard the express."

"More power to you, if you can do the job in the overnight trip to Vesta. I'm thinking it'll take six months—and the gang shouldn't have been allowed six *minutes* aboard! Just because they're Bonmanists—!"

"Bonmanists?"

"Don't tell me you never heard of Bonmanism! Where the devil you keep yourself—!"

"Since my school days, mostly in space. I admit I'm too lazy to catch up on Earth politics."

"Who's talking politics? Sylvester Bonman is a math professor." The Colonel scowled. "I don't suppose you Bard-dreaming Thespians study mathematics."

"Only enough to count the gate receipts," grinned Vardos.

"Then I'll let somebody else explain Bonmanism to you. The fact of immediate relevance is that Sylvester Bonman has inherited a large spread on the planet Delia. His old man was a Proximan pioneer—stalked out a whole valley of prime agricultural land and hung onto it. Sylvester and his Delian brother inherited fifty-fifty, and Sylvester has auctioned off his share among his Bonmanist organization—to perpetuate a Bonmanist enclave. All land goes back to the enclave if Bonmanist owners die or otherwise forfeit."

"But wouldn't such discrimination be against public policy?" interrupted Vardos.

"Now that's the interesting aspect of the law," declared the Colonel. "You can't restrict land bids to certain ethnic or social groups—you can't establish an enclave for redheaded Transylvanians, for example—but there's no law against *intellectual* discrimination. You can found a society dedicated to proving any god-damned crackpot idea, and as long as the *society* is open to all comers, it can make its own laws as to the use of its assets. Which is what Sylvester Bonman is doing."

"Well? Just where does Security come into it?"

"The whole emigrating enclave is traveling to Proxima on this lift-out!"

"So?"

"So some crazy fool the No Fault police can't get their hands on is threatening to erase them on the starship, before they arrive on Delia!"

"Why?"

"The threatener doesn't say *why*!

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

Could be a Delia-for-Delians reactionary. Or an agent of the brother on Delia. Or a math theorist with a grudge against Sylvester."

Vardos exclaimed, "Have the police overlooked the obvious motive? The enclave is a survivor-take-all association!"

"The enclave farmers wouldn't gain by killing each other off. The land goes back to the Society, which would have no motive to decimate the members."

Vardos reflected that wherever there was a fortune to be gained, there was a motive. He asked incredulously, "And this explosive situation is being allowed aboard a starship?"

"How can the Bonmanists be refused passage? The threats may be only a bluff by a mischievous idiot. There may be no murderer aboard."

"But you do take the threats seriously?"

"I wouldn't bet a c-token on any of the Bonmanists arriving on Delia. The murderer has five-and-a-half years along the Waystations to snipe at his victims—unless you spot him first."

Vardos smiled,

"In sooth, you send poor metal to the probe! Professors ne'er a glance at Thespians deign, And farmers turn aside from Bardlike phrase."

"As if you couldn't talk the ear off a brass monkey!" snorted the Colonel. "However, we've just had a bit of luck. A Bonman committeeman named Hakluyt got cold feet and cancelled. You can have his cubicle right in the middle of the snake pit."

"That is indeed luck," said Vardos ironically.

"Yes, sometimes the breaks fall our way," returned the Colonel with gusto. "Well, that's the problem. Somewhere among the thousand passengers lurks a madman aiming to wipe out the Bonmanist enclave."

"And if, by some fluke, I apprehend the culprit—?"

The Colonel's eyes were suddenly ice-cold. "He is to be dealt with quietly—and I mean finally. Why else am I giving *you* the assignment, Starman?"

In the century since the building of Waystation Two, the interior design of starships had altered as drastically as their threshold-of-light engines. At first, the starships had tried to give passengers as much *actual* space as possible. The cabins, along efficiently straight passageways, were dayrooms that converted to bedrooms. This had meant almost no public salons—just one meeting place on each deck.

The design had been a disaster. Even six months in space had been unendurable to all except trained astronauts. Slowly the realization came—*actual* space was far less important than the *illusion* of space. The number of public salons doubled—and tripled. Cabins shrank to cubicles. Passengers thrived—on *illusion.*

At last came the honeycomb starship, in which an aft cubicle *seemed* an hour's journey from a forward salon. The honeycomb ship had broken

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

passageways, split-level salons, two deck neighborhoods. A passenger needed six months in the hexagonal mazes to find out where everything was. Even after five-and-a-half years from Sol to Proxima, few passengers could guess the exact number of salons. It was a favorite question for Proximan quiz shows.

The residence cubicles thus shrank to cozy wombs, to hexagon-wedges that supplied every need, including *illusion*. The narrow inner corner of the wedge was a triangular stall for personal hygiene and laundry. Transversely across the base of the wedge was a comfortable bunk atop a storage locker one meter high, one meter wide and (along the outer bulkhead) 2.20 meters long—ample storage space even for a 5.5-year stock of jumpsuits and undergarments.

At the head of the bunk were controls that put the cosmos at the passenger's fingertips—tachyon-Morse communication from Sol to Proxima, video/audio inter-cabin, entertainment/education tapes, bulkhead mural screens that could activate into a variety of DM views.

Sometimes an entire hexagon was a family home, but it was important for each individual to have his/her retreat from the constant social/cultural/educational/athletic activities of the many salons.

In an emergency an abandon-ship maneuver took more time from the honeycomb pattern, but starship emergencies were very, very rare, and passengers preferred everyday comfort and enjoyment.

The starship *decor,* which changed from Waystation to Waystation, was colorful and flower-laden. Vardos was most at home in the perfection and artistic beauty of space living. He was fond of his native planet Earth, which, after the Quakes and the Glacial Melt, was mainly immaculate sea and well-planned hive cities, but solid-dirt Proxima planets were too natural and crude to appeal to him.

Rejoicing at any excuse to be on a starship—even the mysterious Bonmanism—Vardos skimmed up a spiral staircase from the entry port, followed the deck arrows through the maze of salons and residential cul-de-sacs, and arrived at a double-deck courtyard rimmed by residence hexagons. A banner hung across the courtyard, BONMAN SOCIETY.

In the middle of the courtyard stood a young, pretty girl wearing a floral patterned jumpsuit, a name tag, and the general air of a tour guide.

She also wore a Sol/Proxima Dual

We are such little **men** *when the* **stars** *come out.*

HERMANN HAGEDORN

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

Citizen badge. Even without the badge, her fine, creamy-tan complexion and dark amber hair proclaimed her a Proximan, born and raised under alien sunlight. Her blue eyes were accustomed to far horizons.

When she saw the Bard, she came to him quickly—at once helpful and authoritative. "Have you lost your way? May I direct you? This section is reserved for the Bonman Society."

The Bard scanned her name tag (*Berit Bonman*), bowed and said, "Thank you, Maid Bonman, but I'm a last-minute passenger assigned a cubicle cancelled by a member named Hakluyt."

Her beautiful eyes widened. "Hakluyt *cancelled*?" Oh, dear! Uncle Sylvester will be in an awful flutter! Now Dean Callridge is the only executive committeeman on the tour!"

"Is Hakluyt one of the landholders?" asked the Bard quickly.

"Oh, no. Society executives weren't allowed to bid. Both the Earth Council and the Delian Land Office have been very strict. I *do* wish you looked more like Hakluyt, sir! Uncle Syl is very absentminded!"

She smiled, with a sparkle of mischief. The Bard decided six months on the express would be extremely pleasant. Before he could speak, a brisk, grayhaired man, gangling in an ill-cut brown jumpsuit, came purposefully toward the girl.

She seemed flustered. "Oh, Dean Callridge—"

The man's glance swept impatiently over Vardos—and returned. "Bard Laureate! What—why—how—?"

Berit Bonman explained, "Dean Callridge, this gentleman is a last-minute passenger who was assigned the cubicle Mr. Hakluyt cancelled."

"Hakluyt *cancelled*?" Dean Callridge became a weedy exclamation point. "And this *gentleman* replaces him? My dear child, this *gentleman* is Vardos Vayan, Bard Laureate—Starship Guardian—oh, heavens—!"

He rushed away, darting into a crooked access path between the hexagons.

The girl was staring in embarrassment at Vardos' Dual Citizen badge. "You must think I'm awfully stupid, Bard Laureate, but I've been only a few months on Earth—and the star ship tapes show you costumed, in character. Mother and Dad saw you in person, when you were touring Delia, ten or eleven years ago, but we kids were too young to go along."

"Your parents are with Professor Bonman's group?"

"Oh, goodness, no! They're home on Delia. Dad is Uncle Syl's brother, Wallace. Dad was *so* worried about Uncle Syl, but he couldn't leave Grandfather to manage the valley alone, or Mother to manage my two brothers who are hellions, Bard Laureate, absolute hellions—"

From which the Bard asumed they were normal pioneer offshoots.

"—so I volunteered to come to Earth. I was twelve years old—and would be able to study newer education tapes on the starship anyhow.

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

There were ten of us girls from the Proxima planets, traveling alone to grandparents or Earth schools, and we picked up several more along the Waystations, so our starship mother had her hands full—but she was very nice. Her husband was Maintenance Chief, and she had already raised her own family on the starships.

"The trouble is," Berit frowned, "I hadn't considered how old I'll be when I get back to Delia. Not that twenty-four is so *awfully* old, is it?"

"The prime of life," Vardos assured her, reflecting that he had been twenty-four during his appearances on Delia with Joe Humber's repertory company.

"My brothers tachyoned they'd hogtie a suitor for me—and, of course, I can shop around on the starship and Waystations—"

"Anything wrong with what you're looking at now?" grinned Vardos.

"A *bard*? And over *thirty*?" huffed the girl—but with a tinge of pleasure nonetheless. "The time that I'm wasting—!"

She hurried away, and the Bard chuckled to himself. He started to the spiral ladder leading to the upper row of hexagons—and changed his mind. Maid Berit would have information, if he could get her by herself—

He thought a moment, and located the yet unactivated green arrows marking the route to the lift-off chairs for that section. He followed the arrows to an observation deck. Already the unit steward had lined up the double row of seats for countdown, with name cards affixed to the seat backs.

One hundred passengers were to clamp down in this particular section, and the Bard walked along the row, looking for the name *Hakluyt*. However, starship efficiency had already supplanted *Hakluyt* with *Bard Laureate,* and Vardos found himself paired with a *Theo Dillerson,* a long way from the Bonmanists.

He was perplexed. There *was* a very famous Theo Dillerson, who had worked out a space navigation constant known as the Dillerson Factor, short-warping the spiralling-up-the-inside-of-a-bowl course in a gravitational field. The physicist might still be alive—Vardos could remember the publicity given the new Dillerson Factor in his youth—but probably the name was a coincidence.

He removed his own name card, placed it on the seat next to Berit Bonman's, and brought the replaced card (a *Marvin Lang*) to affix beside Theo Dillerson's. He had almost waited too long. Other passengers, curious about where they had been placed, were wandering into the observation area.

He now sought out his hexagon-wedge, in the upper row rimming the Bonman courtyard. His luggage had been delivered and was blocking the space between the bunk and the lavatory stall. He stowed the cases in the locker under the bunk but did not unpack. He still hoped to leave the starship the next morning at Waystation One.

He was keeping his concentration fixed on the Delian land and the

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

motive of *gain*. Everything else could be a smokescreen. True, the emigrant farmers gained nothing by killing off their neighbors. But the forfeited land went back to the Society—that is, to the men *who controlled the Society's finances.*

Logically, the man who stood to gain the most was the mathematician too respected to be under suspicion—Sylvester Bonman himself.

The Bard had learned a remarkable fact from Berit Bonman. Wallace Bonman had been so worried about his brother Sylvester that he had allowed his twelve-year-old daughter to travel to Earth to investigate.

Never mind that she was a smart, capable girl—or that she would receive a better education on the starship—or that she would have an eminent uncle to look after her on Earth. Her trip was a desperate measure by any standard—yet, with a valley to farm, an aging father, and unruly sons, what else could Wallace Bonman have done?

Slipping into old habits, the Bard kicked off his boots, climbed onto the bunk, elevated the backrest to comfortable height and spun a random scene from the mural wheel. The opposite bulkhead seemed to become transparent, and a Claudian view shimmered into 3-D life. A background of peaks laced together by glittering flyovers—a foreground of jungle flowers.

Knocking startled him. He had not locked the entry panel beyond the foot of the bunk, and it slid aside as he doused the mural and straightened up. An untidy, graying head, fat-faced and vague-eyed, peered around the entry-frame.

"By golly. Callridge was right! You're *not* Hakluyt!" declared the visitor. "I can't understand Hakluyt giving his reservation to a bard!"

Vardos sat crosslegged on the bunk (like a tailor or *yogi*) and smiled. "The starship passenger agent assigned me Hakluyt's cancellation."

"Well, great heavens, a passenger can't fill vacancies in my private society!" The visitor bumbled into the cubicle. "I'm prepared to welcome any friend of Hakluyt—although a bard is rather much, rather much—"

Vardos hardly knew what to make of Sylvester Bonman. His mental picture of a math professor (white-bearded, precise) was so different from the present reality that he could find nothing to say.

Sylvester did not seem to notice. He was maundering on, "Oh, you would never do, Bard Laureate, never. I just can't understand Hakluyt—but maybe the letter—completely forgot—"

He fumbled in the breast pocket of his drab jumpsuit. As he turned his head, his features caught the light of the cubicle. Vardos noted that his eye-color was grayed by the gelatinous gleam of contact lenses. An unusual prescription, he reflected, to cause such color distortion.

Sylvester, after pulling various dog-eared papers from the slit in the jumpsuit, brought out a sealed envelope—

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

smooth, thick.

Even if he had not been alerted by the Colonel's report, Vardos would have acted. He unkinked his limbs, snatched the envelope from Sylvester's flabby fingers, leaped from the bunk, and carefully put the envelope inside the metal discards bin slotted to the bulkhead.

He lifted the bin from its slot, placed it inside the hygiene stall and closed the panel.

A split-second later came a dull bong, with richocheting clangs as the bin and cover parted company and bounced around the stall.

Vardos glanced at Sylvester. The fat face was pallid, the eyes blank. Sylvester had "frozen up," in theatrical phrase. The look was so familiar to Vardos that he could not mistake it.

As a star traveler—a Security agent—Vardos had seen many kinds of shock. Victims of violence mirrored the horror with a rerun at the back of their eyes. Sylvester's blankness was quite different. It was the at-a-loss stasis of *an actor who has forgotten his lines.*

Vardos was reminded of a performance with Joe Humber's company. Medieval costumes and setting. The stabbing of one character by another. The stabbee had not been dying with a realism to suit old Joe. Disgruntled at being reprimanded before the company, the actor had gone off, filled a plastic bag with red paint, and (without telling his fellow-Thespians) had taped the bag behind a razor-slit in the chest of his costume.

During the next performance the stabber, confident of using a harmless property dagger, knifed the stabbee with appropriate verve. The plastic bag burst—"blood" drenched the stabbee—and the stabber stared at the harmless dagger, *knowing* it was harmless, and yet surprised into forgetting his lines.

What had "surprised" Sylvester? Had somebody handed him a real bomb instead of a property weapon?

Vardos stepped to the bunk's communication panel, tapped a code that reached the starship's senior watch officer, identified himself and said, "I've just intercepted a Bonmanite letter bomb. It may have damaged my hygiene stall."

"No alarms have rung on the systems console," replied the officer. "The damage must be superficial. How did a letter bomb come aboard?"

"Apparently in Sylvester Bonman's pocket. What are the odds on putting the entire Society off the starship?"

"Not good. Earth is hellbent on exporting the whole damned problem to Proxima. We'll be with you in a minute, Bard."

The connection clicked off. Sylvester Bonman was stirring to life. "One moment, Bard Laureate. Call the officer. I wish to disembark."

"Impossible. Your enclave is being allowed to emigrate because a delay would mean ruin for the emigrating families. You can't now wash your

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

hands of responsibility for your members."

"I can't be held here against my will! I shall immediately arrange for a *habeas corpus* at Vesta."

As he put on his boots, the Bard reflected that this was rather snappy legal thinking for the hitherto bumbling professor. Borman was right, though. He could not be held beyond Vesta. Now Vardos *had* to clear up the Bonmanist mystery, and before the next morning.

The lift-off warning chimed while the starships's Security officer was interviewing Vardos and the very indignant Sylvester.

The other passengers were already clamped down when Vardos escorted Bonman to his chair, which was in tandem with Dean Callridge. Berit was immediately behind her uncle, but a young man was ensconced where the Bard had connived to sit.

The Bard noted that a reswitch of name cards had been made. Marvin Lang was apparently an enterprising young man! Vardos was still smiling as he clamped down where he originally had been placed, beside Theo Dillerson.

He saw that Dillerson was a ginger-bearded, colorfully-jumpsuited, dapper man of youthful appearance but probably into his fifties. Dillerson smiled at the Bard, "Do you find Syl Bonman so entertaining, Bard Laureate?"

Dillerson knew Bonman? Vardos blurted, "You *are* the physicist who discovered the warp factor? Forgive me—you look so young, I remember the discovery from my school days."

"Does that necessarily make either of us old? I was twenty-two when I published the warp, and you were perhaps eleven—twelve? I shall tachyon a stiff protest to my therapist if I look a day over forty-six!"

Having deduced Dillerson to be at least fifty, the Bard felt a confused embarrassment. Fotunately, at that moment the viewports activated with a replay of Earth scenes—blue water and towering, crystal-hive cities. The chairs hummed as their mechanisms slanted them to compensate for the tilt of the guidance track, now rising on gigantic levers from the bowels of the mountain.

The section steward counted heads and pressed the green button beside his dais. When all sections had reported, countdown would begin.

Vardos knew lift-off came fast, but most of the passengers were surprised in mid-sentence when the punch of atomic power squeezed them briefly into their cushions.

The squeeze relaxed. In the viewports, Earth's seas rippled away, and passengers saw what the starship bridge was seeing—the starstrewn purple-blue of outer space.

The chairs resumed normal position. The inner bulkhead panels flipped to display notices about the salons where passengers could sign up for hobby and cultural activities.

The Bard unclamped, but Dillerson showed no interest in leaving his chair.

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

"An anthill, what?" he smiled. "A frantic scurrying from now until Vespers—and to Proxima, for that matter."

"Have you been a space traveler, Dr. Dillerson?"

"Born on Waystation Four—star-shipped to Earth at eighteen. My dear wife—also a Waystation Four girl—died recently, and I decided to become a Proximan tourist. I may even settle there, if I like it. Quite a scheme, the Bonman enclave. I wonder that Wallace Bonman agreed to it."

"Is Sylvester Bonman one of your colleagues?"

"Not exactly, but distinguished idiots are well-known in most university circles."

"I confess I have no idea what Bonmanism is."

"Good. Don't clutter your mind with it. How far are you traveling?"

"Waystation Two. The Centennial, you know."

Dillerson pulled at his ginger beard. "You're not aboard because of the threats to the Bonman Society?"

"Does a genuine murderer warn his victims in advance? Or kill in a closed group, where he can be so easily discovered?"

"Then may I ask," smiled Dillerson, his bright blue eyes twinkling, "what is the threatener's game?"

"A game of roles and masks, I think."

"Very interesting," said Dillerson. His eyes no longer twinkled.

Winding his leisurely way from the observation deck to the Bonman courtyard, Vardos came upon a tiny refreshment alcove—two chair-boxed tables in a bower of airplants, with a cake-and-wine dispenser.

A dark-haired, dark-eyed young man was standing between the tables, as if he had retreated from the bustle of the passageways but was in no mood for cake. Vardos recognized the Marvin Lang who had sat beside Berit Bonman, and he grinned, "*The damsel stayed not by thy side? Unclamped, she fast to uncle hied*?"

The young man grinned back, "Sad truth, Bard Laureate! I saw you escorting Sylvester. Yes, my luck in getting placed next to Berit didn't do me much good."

"Luck?" The Bard raised his eyebrows. "You mean you didn't switch cards?"

"Glory, no! I wouldn't *dare*! If Berit found out—!"

Who had switched cards? Vardos gestured to the dispenser. "Try some Waystation One grape. First day out is hectic."

Marvin brightened. He sat at a table with the Bard and sampled the purple liquid and a white-frosted square. Vardos began, "You are a Bonmanist?"

"Bard Laureate, when I saw Berit walk on campus to visit her Uncle Syl, I became the most convinced Bonmanist that ever was! I hung around Syl's faculty residence, so that Berit had to fall over me whenever she went in or came out—so, of course, she thought I was an imbecile."

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

The Bard laughed. "You didn't make clear the object of your Bonmanism?"

"By the time I found a chance to talk to Berit alone, her opinion was pretty well formed."

"What *is* Bonmanism? Even though Theo Dillerson told me just now not to clutter my mind with it—"

"Dillerson! Is Dr. Dillerson aboard?"

"You know Theo Dillerson?"

"Yes—in connection with his herding currents for sea farms. My dad has a sea spread among the Hebridean reefs," explained Marvin. "Keeping the different fingerling classes separate was an expensive fencing operation until Dillerson devised his temperature barriers. Fish are very temperature-sensitive, you know, and follow the favorable currents. Dr. Dillerson came personally to help set up Dad's temperature grid. It's a three-dimensional problem in both temperature and water quality, and Dillerson generally works out the basic grid for each sea farm buying his system."

"Buying? His inventions are not in the public domain?"

"Oh, the *inventions* are, but other manufacturers haven't matched the Dillerson hardware. He's into a lot of technical improvements. He holds the patent on a new tachyon-beam sender/receiver that automatically mends a cosmos-disrupted message."

"I never realized he was a practical inventor of that scope. He gave me to understand he had just retired from a university post."

"He's been Research Chancellor of the New Zealand Educational Aggregate—but it's not a *teaching* post."

"And Sylvester Bonman?"

"Math professor at Northwest Rockies."

"Do you know if the twain have ever met?"

Marvin looked doubtful. "Would they need to meet? Why do you ask?"

Vardos changed the subject. "You're aboard merely as a persistent suitor?"

"I *would* have been, if the land deal hadn't turned up. But the old grandfather died on Delia—and Sylvester made his share of the estate available—and I persuaded Dad to stake me to a bid on a section.

"Not that I would have got anywhere without help from Berit," added the young man. "I guess she felt sorry for me. The estate details tachyoned from the Delian Land Office didn't mean a thing. Berit knew the land much better than her Uncle Syl. She came to me and said, 'The best buy is Lot 7—it's described as nonarable swamp, but Dad has drained the west half, and the soil is very rich. Give a minimum bid and reckon three years to get the land in production.'

"She told me not to waste time on what seemed to be the two best sections, but exactly those sections went to cronies of Callridge and Hakluyt, who weren't allowed to bid, as Society executives."

"Do you think the bidding procedure was fraudulent?"

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

"No. Earth Council auditors received the sealed bids and opened them at a public meeting. What I *do* think is that Callridge and Hakluyt combined forces to make inflated bids, with the idea of subdividing the land to recoup the purchase price. Unfair tactics, of course. Maybe the threats have come from a disappointed bidder."

"That's why Hakluyt cancelled?"

"To be honest, Bard, I doubt Hakluyt ever meant to board the starship. He's a businessman, with many Earth interests. Why should he travel to Proxima, when he can take his Delian profits through bank transfers? Sylvester is a Proximan—and I doubt Callridge is a native Earthman. It's natural for those two, with only university ties to Earth, to leave. But Hakluyt—"

Had Hakluyt sent the letter bomb to Bonman? How had the Bonmanist triumvirate come together? Where had they first met? Perhaps none of them were Earth natives. In which case, perhaps they had met *in space*—

Emergency Services occupied a vertically-aligned stack of hexagons in the center of the starship, so that each deck had its own first-aid center. In the topside hexagon was a wedge handling Security Data Clearance. A robot function, the wedge was usually unmanned.

Vardos twirled up the spiral ladder and was surprised to see a starship-uniformed technician repairing a machine in Data Clearance. The technician was a white-haired woman wearing the diamond-rimmed badge that denoted the maximum 33+ years of starship service. Why was she still working, when she could retire in luxury to the planet of her choice?

She was now deftly replacing sensors behind an opened panel. Vardos smiled, "An hour from Earth, and already disfunctioning?"

The woman smiled back, "Half-life doesn't seem to last as long now as when I was a girl. Would you like a tachyon beam to Dhaulagiri, Bard Laureate?"

"A beam to Logbook Archives, if I'm not troubling—"

"Not at all." The woman snapped the panel shut. "I feel I must remind you, Bard, since I've seen much cross-purpose give-and-take with the Archives, that robots answer only what they're asked."

"So I've found, to my exasperation," nodded the Bard. "However, I'm only after a reference in the passenger lists."

He stepped aside so that the woman could leave the wedge. He reflected that long-service employees had a poor opinion of juniors.

He approached the Archives relay console, pressed his thumbprint on the identification slot, keyed his code and began programming. The answer came, with the slow conversion-printing from tachyon Morse.

Sylvester Bonman had been a starship passenger thirty-two years before. His data glided onto the tape: Delian—male—aged twenty—blue

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

eyes—light brown hair—no scars. Boarding port, Angela.

Thus Sylvester was now fifty-two, his hair grayed, his eyes muddied by thick contact lenses.

Callridge and Hakluyt had been aboard the same starship. They were younger men, from the Waystations.

So the core of the Bonman Society had been formed by three youths who had met on their journeys to Earth.

And Theo Dillerson? The Bard paused before feeding his name to the computer. Was he assuming too much because he had been placed next to the famous physicist? There need not be anything significant in Dillerson's interest in Bonman.

Still, it would be interesting to know when Dillerson had left Waystation Four. He relayed the name.

The beam returned a NEGATIVE.

Theo Dillerson had never been a passenger in space!

While Vardos stared at the tape, wondering why Dillerson had lied—and whether the lie was part of the Bonman problem—he heard a "Thank goodness!" from the entry.

Berit Bonman, pink-cheeked from exertion, was standing there. "I figured you had come to Security," she explained, "when people said they'd seen you heading toward Emergency Services. Lucky for me you're so *conspicuous,* with gold stars all over you!"

Vardos would have preferred a more flattering adjective than *conspicuous,* but he said, "How can I be of service, Maid Bonman?"

She glanced around. "Where can we talk? I *do* need advice from somebody *older.* Marvin is good-hearted, but—"

Vardos wished the girl would not regard him as Methuselah. However, he led her to a space between hexagons where folding chairs had been stacked. He set out two chairs behind a flower-hung divider and asked, "What do you need advice about?"

They sat down, and Berit began, "Uncle Syl says he's leaving the starship at Vesta and returning to Earth. Should I stay with him—or continue to Proxima?"

"Continue to Proxima," said Vardos immediately. "I'm beginning to think something very ugly was cooked up thirty-two years ago, in anticipation of Sylvester's inheritance from his grandfather."

"Anticipation? But Uncle Syl owned the land before he left Delia!"

"What! Sylvester left Delia when he was twenty—"

"Yes. At that time Delia was raw frontier, with no education except sporadic Earth tapes. Uncle Syl wanted to start off to an Earth university when he was fifteen, but he knew Dad and Granddad needed help to clear the land, so he stayed until he was twenty and the first flood of immigrants provided a labor force."

"Wasn't there ill-feeling because he left?"

"Absolutely none. But Granddad was anxious about the future, not realizing he'd live for so many years. He divided his entire estate down the

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

middle and gave each son his half at that time.

"Of course, arable land is difficult to divide in that way," she went on. "Uncle Syl agreed that while he was on Earth, Dad could farm what he liked of Syl's half, as long as he paid the taxes on it and generally improved the property."

Vardos remarked, "Those brothers must have been unusually good friends."

"Oh, they were. Possibly because they were so different, there was no sibling rivalry. Grandad said Dad was a chip off the old block—but he was very proud of Uncle Syl's genius.

"Because Uncle Syl was convinced his own career would always be on Earth, he made a will leaving his half of the valley to Dad, in the event he himself had no heirs."

This swept away Vardos' theory that Sylvester and two other youths had conspired on the starship to milk a future inheritance by sale and resale through a bogus society. Sylvester had already owned the land, and he wanted it to return to his brother Wallace.

Vardos recalled Theo Dillerson's *I wonder that Wallace Bonman agreed to it.* What could Dillerson know about Wallace Bonman?

Vardos asked the thoughtful girl, "Has your uncle—or father—ever spoken of Theo Dillerson?"

"I don't know what to answer," she said finally. "Everybody talks about the Dillerson Factor. I've heard Dad say Uncle Syl predicted the warp would be found. I guess Uncle Syl was very bright as a boy."

"But not now?" smiled Vardos.

"Do you suppose he's ill or drugged?" wondered Berit aloud. "He seems so—lazy and slovenly, and Marvin says WRU never would have kept him on except for his early work in prime number finitudes. That *was* brilliant. But lately his energy, such as it is, has been devoted to Bonmanism.

"Dad and Syl had fun with the code as kids—and with tachyoning when Syl was on the starship—but Dad thinks it's nothing for a grown man to make into a philosophy. You agree, don't you, Bard?"

"Oh, yes, completely," said Vardos, more than ever in the dark about Bonmanism.

The girl rose from her chair. "Yes, I may as well continue to Proxima. I have no influence over Uncle Syl, and I *do* get tired of hearing him talk about the old days—especially when I was already tired of Dad's recollections about the same things."

Recollections, thought the Bard. If he could get Dillerson to talk about his alleged past on Waystation Four—? Would he hold still for questioning?

Vardos rose to escort Berit away. He suddenly cursed himself for missing a cue. He began, "Maid Berit, I feel somehow that Theo Dillerson is a part of the Bonman mystery. Would you come with me while I talk to him? Perhaps you may catch a reference—a slip of the tongue—"

"You mean, I'd be a part of starship Security? Oh, yes!" she en-

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

thused. "I guess *that* would be something to tell my snotty brothers!"

She fluffed her amber hair in an innocent preening gesture. A sweet, natural girl, reflected Vardos, wondering if Marvin Lang had, after all, reswitched the name cards.

The minor mystery nagged at Vardos. Who else could have wanted Marvin to sit with the girl?

But wait a minute. Maybe he was stating the problem wrong. Where *had* everyone been placed? The unit steward had conscientiously grouped the Bonmanists together with due consideration for rank—Sylvester with Dean Callridge, Berit with—?

Of course, thought the Bard, what a fool I've been!

Ordinarily a person could spend all day wandering through the hexagonal mazes on the off-chance of meeting a friend. However, Dillerson had evinced a distaste for starship activity. If he had, in fact, never been a space passenger, he would be keeping to himself lest he give the bluff away.

Vardos looked up the location of Dillerson's wedge on the starship directory, and led his charming Security recruit to the entry panel. A knock brought Dillerson's bright eyes and ginger beard over to the half-opened panel.

"Forgive the intrusion, Dr. Dillerson," smiled Vardos. "Maid Bonman was regretting that she might not meet you before disembarking on Vesta. She wants to tell her grandchildren how she talked with the famous Theo Dillerson."

The panel opened full width, and Dillerson popped out, smiling at the girl. "You're very young to have grandchildren, Maid Bonman. A new tachyon effect?"

She laughed. "I was thinking of asking you for an age-warp, Dr. Dillerson. Goodness knows when I'll get home to the suitor my brothers have hogtied for me!"

Dillerson looked concerned and pulled his beard. "Disembarking at Vesta? Come—let's talk. By now they've lounged the observation deck."

The "lounged" was pure starship, and meant that the lift-off chairs had been regrouped around low tables holding chess sets and other games and puzzles. Dillerson could have read the term in a novel, but without hesitation he hustled ahead of Berit and Vardos to the observation deck.

They settled comfortably into a chair grouping, and Dillerson asked Berit, "Why are you disembarking?"

"Uncle Syl is returning to Earth," she replied, eyes downcast as the "Security role" required.

Dillerson seemed amused. "And what reason did the professor give?"

Vardos interposed, "Someone handed him a letter bomb, which exploded after I grabbed it from him."

"Exploded!" exclaimed Dillerson, apparently sharing Sylvester's surprise that a bomb should explode, of all things! He said seriously to Berit, "You'd better continue home to

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

Delia. You've had no—unpleasantness—with Sylvester?"

The girl looked amazed, but Vardos cursed himself for being an unthinking fool. Berit was a beautiful young girl, likely to arouse nonavuncular feelings in even the best uncle.

She was saying, "Why, Uncle Syl has been so protective and paternal—! Life has been terribly dull! You won't believe this, Dr. Dillerson, but even Marvin Lang was beginning to look good to me!"

Protective and paternal? The word *overplaying* crossed the Bard's theater-oriented mind. He had thought Sylvester's absentmindedness was laid on a bit thick.

Berit and Dillerson were laughing at the girl's joke. The physicist's blue eyes mirrored the girl's sparkling merriment. His infectious grin—

If he had been onstage, the Bard would have been surprised into *forgetting his lines*. If the observer disregarded Dillerson's dyed hair and beard—if he made allowances for the masculine strength of feature—he saw an unmistakeable family resemblance.

Family resemblance! But Berit had only one Earthside relation, her Uncle Syl! Vardos quickly reviewed his impressions—Bonman's over-playing—Dillerson not ringing true—Wallace Bonman smelling a rat, even light-years away—

If Dillerson was the real Sylvester Bonman, a good deal was explained—but far from everything. Why had the situation lasted so many years? Had there been a real Theo Dillerson—and if so, what had happened to *him?*

Was the amiable pseudo-Dillerson the source of the threats? Vardos thought not. For some reason he was waiting for the showdown on Delia—and showdown there would be, since Wallace would surely recognize him on sight.

The Bard brought his mind back from his speculations. He saw that Marvin Lang had wandered into the lounge. The young suitor looked wistful, but wary of receiving a rebuff from Berit. Dillerson called him over. "Marvin! Good to see you again!"

Vardos rose—with a conspiratorial glance and motion to the girl, as if she were now on her own as a Security agent. He said to the young man, "Take my chair—I have Vestan matters to clear away before supper."

Marvin responded gladly, and the girl made no comment. With a single gesture Vardos had convinced her of the tremendous importance of listening to what Theo Dillerson had to say.

In the entire Sol/Proxima system, no more skillful Thespian existed than Vardos Vayan.

He spiralled topside to Security Clearance and frowned at the Archives computer. Damn those literal-minded robots! The identity "Theo Dillerson" must have had a genuine background on Waystation Four, to withstand the publicity glare of the Dillerson Factor. This, in turn, implied a genuine journey to Earth. Why had the robots not given him the logical answer?

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

Vardos swallowed his pride, pressing the Assistance Requested button.

Vardos swallowed his pride pressing the Assistance Requested button.

The white-haired female technician arrived and smiled, "Something not fitting together, Bard?"

He looked at her diamond service badge. "The famous Theo Dillerson. Archives doesn't know him."

She raised her eyebrows, picked up the discarded tape, looked at it briefly—and burst out laughing. "Naturally not! Archives wouldn't know *me*, either—and I've worked the starships for nearly forty years! You've programmed for *passenger* information, Bard!"

"Oh, Thespis," muttered the Bard, feeling foolish. "So Theo was a *crewman*."

"Of course. It's generally known he discovered the Factor while he worked his way from Waystation Four. I noticed his name on the directory and wondered if he's changed very much." She sighed and patted her white hair. "Thirty years is a long time."

The Bard reflected that Dillerson had run into bad luck—yet he would scarcely expect to find a fellow-crewman of those days still working.

Vardos asked the woman, "Forgive my curiosity—but why is it you haven't retired?"

"Because of the Trail Blazer Centennial," she explained, "which has demanded so many extra tourships that the entire service is running short-handed. I had planned to retire five-and-a-half years ago, on Proxima, but even at that time the personnel shortage was looming, and I agreed to an additional round-trip."

"Were you well-acquainted with Dillerson?"

"He was too young for me," she smiled. "He was eighteen and already married. Arla, her name was. A sweet girl and, frankly, much too good for that redheaded heartbreaker. Who could suppose Theo had the brain to discover the warp Factor?"

Was Arla the "dear wife" who had recently died?

Vardos asked, "Was Dillerson together with Sylvester Bonman?"

"Bonman was not aboard our starship."

She consulted the discarded Bonman data and added, "This shows that Bonman was on the *next* month's starship. Theo had been a month on Earth when Bonman arrived at Dhaulagiri."

The Bard was too confused to make head or tail of the mystery. He thanked the women and then she left the wedge.

How did the jigsaw pieces fit together? A very real Theo and Arla Dillerson had left Waystation Four and had worked their way to Earth. One month later the real Sylvester Bonman, plus Callridge, Hakluyt and *one other plotter* arrived at Dhaulagiri. There had to be another plotter, since another Bonman took up his education at WRU.

So far, the plot was understandable. Callridge, Hakluyt, and "X"

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

had determined to steal Sylvester Bonman's wealth. For years on the starship they had heard, and memorized, his stories of the valley. They knew of his code-communication with his brother, and of his mathematical studies.

The youthful group disembarked at Dhaulagiri. Safely past Security control, they immediately murdered—or *thought* they murdered—Sylvester. Primed by stolen notes, the imposter "X" arrived at WRU, made a big splash with the prime number finitudes, achieved faculty status and desperately tried one ruse after another to conceal his lack of genius—"absentmindedness," Bonmanism.

Why hadn't the plotters sold the land immediately? Vardos thought they were afraid of the old man on Delia. They could gradually erode Sylvester's bank credits without fearing a reaction, but the land lay too close to the old man's heart. They had to wait until he died.

Meanwhile they were living on the real Sylvester's reputation and income—probably considerable income. The "Sooners" into the Proximan planets were wealthy adventurers, ex-members of the astronaut elite, with the influence to scrounge scrapped spacecraft and the credits to refit them. Wanting to dispose of his affairs, old Bonman had divided his wealth between two equally beloved sons—and had proceeded to live thirty-two more years.

The three schemers on Earth had flourished. "Bonman" had become a professor, Callridge a dean, Hakluyt a businessman. What had been the reaction when Wallace had tachyoned that Berit was on her way? And he must have tachyoned, since he could have no mistrust of his brother's *identity.*

Vardos recalled the gelatinous gleam of Sylvester's lenses. Berit had never seen her uncle—and middle-aged men seldom resemble boyhood pictures. But if the family were blue-eyed, the girl would remark upon a brown-eyed uncle. He could not change suddenly from a brown-eyed to a blue-eyed professor, but he could "gray" the color, as if from a special prescription.

He could also rehearse and retell the old stories Berit would recognize—could carefully play "Uncle Syl." Each day would now be bringing the Delian land nearer, since the old grandfather could not live forever.

And all the time, none of the schemers had recognized their victim in Theo Dillerson, who had dyed his hair and striven to keep as young as his new identity. The real Sylvester had been almost twenty-six when he had arrived on Earth. The real Theo had been twenty. Thus the discoverer of the Factor had been twenty-eight, not twenty-two, but he had been forced to conform to Theo's starship data.

Why had he never spoken out? Granted, his genius had brought him comfortable wealth. He did not need the Delian land. But he could hardly have liked seeing it fall into the hands of scoundrels. What had restrained him from going after them?

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

Perhaps the answer lay in a further question. *What had happened to the real Theo Dillerson*?

The supper carillon was chiming. Vardos decided that until his deductions could be confirmed, he had to accept "X" as Bonman, and Bonman as "Dillerson."

The observation lounge was now crowded with hungry passengers. Vardos smiled at seeing excited children scooting among the grouped chairs. The next day the children would have their own nursery/schoolroom/playground deck, after the local Earth/Asteroid passengers disembarked at Waystation One.

The group around Dillerson had expanded into a regular Bonmanist seminar, as chairs had been swung into a circle. Apparently Dillerson had called the enclavists over, since strangers would not have so presumed. As farm emigrants, they were hardly typical, with pallid, city-hive, academic countenances. One was saying earnestly.

"—apply Bonman thought-habits to the galaxy's most valuable resource, arable land."

"Yes, Bonmanism has a definite core of value," agreed the red-bearded physicist gravely, "and I think you should attack the time-lag from that angle. Arable land has no subjective/objective dichotomy—"

Vardos saw Berit catch sight of him and slip away from the attentive circle. She led him away and said, "I don't know why intellectuals have to use special jargon for simple truths!"

He smiled, "What truths?"

"As Dr. Dillerson says, the emigrants should be tachyoning Dad to agree to a profit-sharing arrangement whereby he continues to develop the whole valley during the next five-and-a-half years. It's to nobody's advantage for the auctioned land to be neglected and grow sour and weed-filled. Dr. Dillerson said Marvin could borrow from Dad—mortgage the land against future profits—so that Dad could hire a work force and start draining the swamp immediately. The galaxy *does* need food. Why, think of what the Asteroids alone import for their wheels! While on the final Waystations, we could be eating vegetables from the new farms in the valley!"

The Bard surveyed the group. "Marvin told me the best land has gone to cronies of Callridge and Hakluyt. Which are they?"

"Oh, they're not here. Dr. Dillerson wanted only the bidders Marvin and I judged to be sincere emigrants. Marvin asked about the danger of reckless subdividing, and Dr. Dillerson assured him the Land Office would not allow it."

The Bard understood that the real Sylvester was trying to bring justice out of the chaos that would result when the fraud would be revealed. As the legal owner, he could admit the honest bidders and bar the speculators, reserving their sections for his brother's family.

There was a simultaneous rising-from-chairs in the enclave group as

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

Dean Callridge escorted the Bonman Society's prophet into the lounge. Vardos had to admit that the professor, whoever he was, made an impressively benevolent figure. He came toward his members—and paused at the sight of Theo Dillerson.

Berit capably hurried to do the honors. "Uncle Syl, have you ever met the famous Dr. Dillerson?"

Dillerson, who also had risen, held out his hand. "An honor, Professor Bonman. I've just been getting acquainted with your enclave."

Bonman responded, shaking Dillerson's hand, "A pleasure to meet personally the inventive genius from the antipodes!"

Had the professor not recognized Dillerson? Well over thirty years had gone by, and it sometimes happens, thought Vardos, that a far-off view of a person is more telling than a near view. The professor was seeing the physicist's red hair and beard, the colorful jumpsuit. Bonman was being distracted by the *immediate*.

Dean Callridge had a longer view—of stance and gesture—of bone structure and face profile. He stared at Dillerson—and paled. His round-eyed glance went wildly to the Bard. What he read on Vardos' countenance caused him to crumple to the deck.

Even while Callridge was falling, Vardos shifted his attention to Dillerson. He could swear he saw a jerk of surprise, and a deliberate averting of his head.

Bonman again seemed at a loss. His glance wandered, as if seeking an explanation. Dillerson had stepped to the nearest bulkhead, pressed the Emergency button, and was hastening away, as if to speed the rescue.

There was a flurry of concern. Helpful hands came with cushions and tried to ease the body on the carpet. Emergency Services was there in a minute, with oxygen and heart stimulants. Callridge was borne away, unconscious. His heart had not been equal to the shock of recognizing a man he had thought long since dead.

Medics worked over him and installed him in an Emergency wedge, attached to a life-support machine.

Supper was subdued, especially among the Bonmanists. Usually, first night out, there was an air of happy suspense as the passengers unfolded their chair trays and the unit messmen set them with white cloth, china, silverware. The covered ceramic serving dishes came up the galley shaft, steaming hot and delicious.

Callridge's heart attack put a damper on the meal. However, the professor had bumbled after his fallen committeeman, and the less affected diners felt free to enjoy the food.

Dillerson had returned, and seemed shaken, frequently glancing at Berit's troubled face. Whatever had happened in the past, the present tangled web was partly of his own weaving, and he was obviously distressed.

The Bard, eating sea-trout-in-wine-sauce, reflected that the Security assignment was dissolving and trickling away. He was convinced that the Bonman Society's triumvirate were

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

murderers and thieves—but, without evidence from Dillerson, what could he do about it? Hakluyt was on Earth. Callridge and "X" would be leaving the starship at Waystation One.

Moreover, in bringing the three to justice, he would be involving the likeable genius who had discovered the Dillerson Factor—and who must have had a secret of his own which had forced him to silence all these years.

Not that the Dhaulagiri Colonel wanted the farce of a No Fault trial. He wanted a quiet end to the nuisance. *Why else am I giving you the assignment, Starman?*

After supper, chimes called the replete diners to the hobby/cultural/entertainment activities of the salons. The lounge emptied. Marvin Lang persuaded Berit to a music/dance assembly on the Transient/Asteroid deck.

Finally, only Vardos and Dillerson were left, in the Bonman grouping. The unit messmen rearranged the chairs, whisked away all evidence of supper, and changed the effect of pervasive sunlight to cozy starclusters above the chair groups. Chess pairs began their ploys and gambits. (The card players had their own salon.)

Vardos reflected that he and Dillerson were also playing chess. He made a bold move.

"The Centennial has occasioned an unexpected problem, Dr. Dillerson," he smiled. "The manning of extra tourships has drained starship personnel reserves. Maximum-time employees are being retained or called back."

For a moment Dillerson showed polite interest. Then his genius-mind quickened with the implications of Vardos' statement. He raised his eyebrows slightly and waited.

Vardos went on, "This afternoon I encountered a data systems technician who wondered if you had changed much since you and your wife Arla signed aboard at Waystation Four."

Dillerson hesitated, then said wryly, "I had supposed I had changed a great deal—past recognition—"

Vardos realized the physicist had seen Callridge's wide-eyed shock, and had not expected any of the Bonmanists to recognize him again. He had been another man for so many years. Probably he felt he would not even recognize himself, if the young Syl Bonman appeared before him.

They were interrupted by the unit steward, who handed Vardos a blue Communications infold. The message was a single word—DHAULAGIRI.

Vardos held up the blue paper and remarked, "The hours are going, Dr. Dillerson. We both know I was put aboard to take positive action."

"About the Bonman threats? By all means, take action, Bard. Why should you assume that I'm an interested party?"

"Because you switched seat cards to sound me out. As soon as you boarded, you went to the lift-off chairs to see which committeemen were accompanying the enclave. The unit steward had prepared the seating from the advance passenger list—

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

Sylvester/Callridge, Berit/*Hakluyt*. When I replaced Hakluyt, the steward quickly put my name on his chair and hurried off to other duties.

"I never should have assumed Marvin switched the cards," added Vardos. "He was to be with Berit long years in space. He had no need to rush things. But you wanted to know how long I would be aboard, because *time* was of the essence."

"Not for me, Bard Laureate."

"Not for your *plans*. The assay of the enclave was to take shape *en route*. And as proof that nothing particular was on your mind, you had fun playing further with the seat cards. Marvin Lang had been seated somewhere with the enclave. But you knew the lad and wished him well, so you paired him with your niece Berit."

Dillerson said nothing. The Bard went on, "I have theater-trained eyes. I look past dyed beards. The family resemblance is striking. A common genetic phenomenon. Wallace was 'a chip off the old block,' but his daughter inherited the family lines that had formed her 'different' uncle.

"No, you did not intend to do anything with the three men who had robbed you, but you knew *they* had to do something before Vesta. The conspirator I think of as "X" had to find an excuse to disembark before the starship left the inner Sol planets. He had to stay light-years away from brother Wallace. How could his exit be contrived, so that Callridge and Hakluyt could take over the exploitation on Delia?"

Dillerson murmured, "So you've grasped the forfeit/resale swindle!"

"And also the fact that "X" was doomed as soon as he signed over the land to the enclave. Only after he was dead and cremated could Callridge and Hakluyt be sure his mask would never be ripped away.

"However, "X"'s own problem remained. What excuse could he give for leaving the starship at Vesta? The answer was, that he felt himself in danger aboard. Hence the build-up of threats. Hence the letter bomb, which he had planned to show to a starship officer. When he heard a Guardian was aboard, he came to me instead, and played out his little scene.

"And the bomb *went off*! His committeemen had handed him a real weapon instead of a prop. A few seconds earlier, the bomb would have gone off against his chest."

"Or in your face, Bard Laureate?"

"Yes, I was lucky. As the Colonel said, sometimes the breaks fall our way," smiled Vardos. "However, "X" had been doublecrossed, and he apparently blamed the absent Hakluyt, since he seems to have met Callridge normally afterwards.

"The three scoundrels were dangerous enough when things were going their way. Thwarted, they are death on wheels. My job is to—take action. But I don't want to embarrass or jeopardize the man who calls himself Theo Dillerson. If I could know what happened to what the technician called 'the redheaded heartbreaker' from Waystation Four—"

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

Dillerson nodded. "Yes, of course. You must be wondering about foul play. Very well." He considered a moment and began, "Yes, I'm Syl Bonman. The valley was my father's dream come true. For years he had battled space—had built and scrounged, starved and suffered. My mother had trailed us after him along the Waystation wheels—how primitive the stations were, then! She died a few months after joining him in the valley. Wallace was twelve, I was ten.

"On a new frontier, you either dig in or die. We boys dug in. Wallace was like Father—a brawny, tireless worker. I was an inventive lazybones who would stay up all night figuring how to simplify the next day's work. We made a better team than you might suppose, but Father and Wallace could see that my real career would be in laboratories, not cornfields.

"By the time I was twenty, the valley was showing good profits. Father had a contract with the starship service's food processors, and machines and labor were beginning to pour in from Earth. I felt free to go my own way. I had my own bank credits from the valley operation and wanted nothing more.

"However, Father had got it into his head that a person always died as soon as his dreams had been realized. Mother certainly had died as soon as we all were happily reunited, and her death had affected him deeply. Before I starshipped out, he insisted on dividing his wealth equally between Wallace and me.

"There was no talking him out of it," sighed Dillerson. "No telling him he was impoverishing himself. He was sure he'd be dead before I reached the first Waystation.

"I was excited about being on my own, but I didn't want to lose touch with Wallace. For those of us who can't use Security blank checks," smiled the physicist, "the tachyon beam is very expensive. So Wallace and I devised a kind of math shorthand that could express a half-dozen subjects in the standard message. Useful, but hardly worth the expansion—!

"Well, no point to going into Bonmanism, despite its popularity with the Consumer lobbies—"

What in Comus *was* Bonmanism? wondered Vardos.

"I regressed on the starship," Dillerson was saying. "As a child I had never played. We had no young companions in the valley. Aside from old tapes, I didn't know what entertainment was. When I sampled the social activities on the starship, I wanted to make up for lost time. Consequently, I trouped around with teen-agers who should have been too young to interest me.

"Also, I'm afraid I swaggered. I was a young man of fortune. Craving companionship, I talked too much—about the valley—about the tachyon code—about my work with ultimate prime numbers. My carelessness invited the conspiracy that was eventually formed by those three young adventurers from the Waystations,

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

Callridge, Hakluyt, and Sloyd, whom you think of as 'X.'

"With all the carousing, I had not neglected the education tapes, and I had qualified as a graduate science student at WRU. Callridge, also, had been admitted to a university. Hakluyt and Sloyd were born freebooters. Toward the end of the starship voyage, I had become more cautious—and about time! So I kept the Factor details to myself, along with other ideas I have since implemented.

"I was, in fact, secretly glad to be quit my hitherto boon companions, and I only reluctantly agreed to a final fling in the tourist enclave at Mount Dhaulagiri, before we split up. We arrived at dawn. Disembarkation took the usual hours, and we were at the base of the mountain in the early afternoon. We engaged hotel rooms, ate—and decided to take a robot aircar through the lower passes of the nearby Himalayas.

"The aircar is a standard tourist attraction. I was as eager as the others to see the grandeur of my new planet. Being employed by Dhaulagiri, Bard, you know the aircars fly a programmed route, setting down at guardrailed observation platforms. The tour is a failsafe robot operation—but I was destined not to come back.

"The first observation platform was in a corner of the deep pass leading out from the enclave. I sensed a repressed excitement in my companions as we climbed out of the aircar. Sloyd called my attention to a far crag—and suddenly I felt a crack that seemed to split my skull. I was wearing a padded cap—starship passengers are extremely sensitive to planetary winds—and the padding undoubtedly saved my life. I was unconscious for only a few seconds, but when I came to, I was hanging over the outside of the aircar. The gang did not want my body to fall directly from the platform, lest it catch somewhere and be observed.

I felt the chopper spin over my head and thought with panic that I would be swept up in it—but I was flung *off*. I had no chance of clinging to the slick fuselage. I fell—and ropes suddenly seemed to burn my body as they slowed my fall. I could see a heavy insulated wire slowly rise above my head as parallel wires were pulled down by my weight.

"I had fallen onto disused strands of power cables that had been strung along the pass during the years when the Dhaulagiri enclave was being developed. Of course, even when I arrived on Earth, Dhaulagiri was taking its power directly from the energy satellites.

"I threw an arm desperately over the rising wire, not wanting to be tossed as if on a trampoline. The whole support began sagging, in slow motion, as age-rusted fittings pulled from rock supports. But even though the immediate supports broke off, the continuing wires held, and I simply sagged down—down—down—until I could pull myself along the wires to a lower level of the pass."

"You were fortunate," interposed

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

the Bard, "the gang had chosen the first platform instead of a remote one."

"Well, the first five minutes were all they could be sure of, since it was the interval between aircar take-offs. Suppose they had gone on—and had overflown another group who had lingered at a platform—or were overflown by a group that had not bothered to stop?"

Dillerson was retrospective a moment. "I knew I was only a short distance from the enclave hotel. Five minutes in an aircar could mean a week on foot, but at least the direction was clear. I was not frightened so much as disgusted with myself. I assumed the three had killed me for my Earth credit card and bank drafts, and I determined not to tachyon my stupidity to Wallace. Better to stand the loss and learn the lesson.

"Darkness fell. The planet isn't as cold now as before the Glacial Melt, but the pass was a freezing hell to a pampered starship passenger. In the far sky was the glow of the tourist enclave. I watched it as I jumped, sang and exercised to keep my blood circulating.

"At dawn I was exhausted and wanted to sleep, but I forced myself to keep going. All day aircars whirred a thousand meters above me. In the late afternoon, weak from hunger and in excrutiating pain from my cracked head, I stumbled into the ravine below the terraces of the tourist hotel. I had assumed I could follow the ravine to level ground, but it dropped into a deep crevice. I had to climb *up*—or wait until a stray tourist noticed me.

"By this time I was desperately hungry, so I began clawing my way up to a terrace. I reached the cement support pillars of the platform but kept slipping back as I tried to climb them. I sat at the base of a pillar—and lost consciousness.

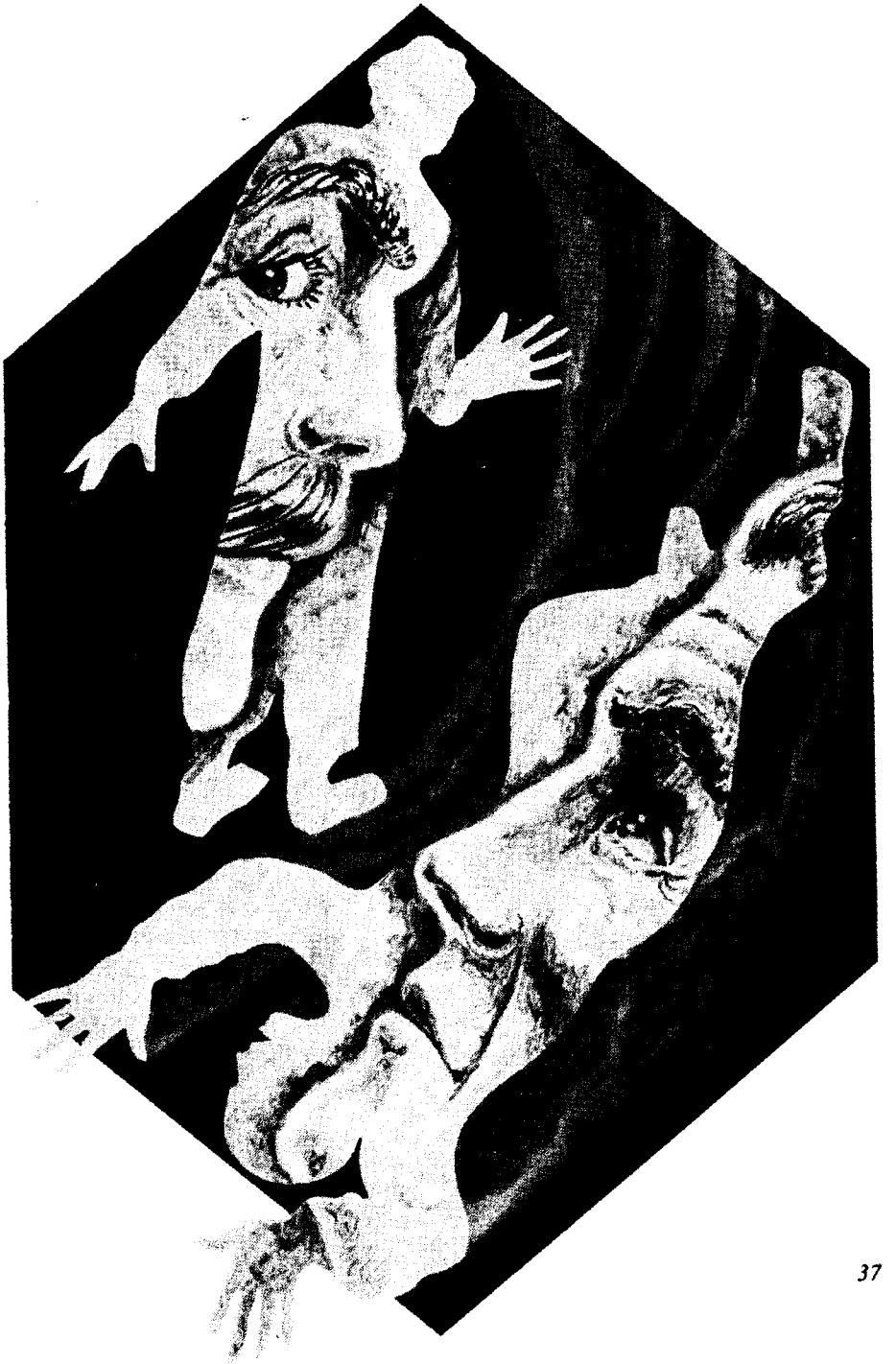
"Voices woke me. a man called, 'Come over here, Arla—someone dropped a necklace over the side of the trail.' A girl answered, 'Oh, Theo, I don't dare—it's so steep!' 'Gold with a diamond pendant—just *look* at it, Arla!' he said.

"I had opened my mouth to yell for help, but the girl screamed and said, 'No, Theo, no!' I heard a struggle and craned my neck to see a girl clinging to a rock pinnacle while a man tried to throw her into the ravine. She twisted suddenly and sank her teeth into his wrist. He howled—she kicked—and the man slipped over the edge. His body bounced off the side of the ravine and fell into the crevice.

"And *then* my dazed wits yelled 'Help!' as loudly as I could yell. I heard a funny scream from the girl. She ran onto the terrace, leaned over and sobbed hysterically. 'Oh, Theo, if I help you up, you've got to promise not to kill me again!'

"I had to pull off my padded cap before she was convinced I wasn't Theo. She took off her long coat, knotted the sleeves around the balustrade post and let the fabric drop. Once again I hitched my way up the pillar—but this time I could grab the coat and haul myself to the balustrade. She helped me over the

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED



LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

rail and we stared at each other—murder victims who had survived.

"Arla was employed at the hotel. She and her husband Theo had arrived the previous month from Waystation Four—and Theo had run off with a girl he had met on the starship. Arla was marking time until she decided what to do next. To her surprise Theo returned to Dhaulagiri, apparently in a repentant mood. After her work shift, they had gone for a walk on the terraces. She could not understand why he had tried to kill her. Unless he was so impatient that murder was less trouble than divorce."

"Or perhaps he raged inwardly because he blamed Arla for his own guilt-feelings," remarked Vardos.

"A bard's point of view—and perhaps right," agreed the physicist. "But Theo had placed Arla in a wretched situation because of the No Fault crime laws. No matter how she explained—or I corroborated—she would be arrested for Contributory Murder and imprisoned—perhaps for years. From the first moment, I was attracted to her and wanted to help.

"When she heard my story and found out I was Sylvester Bonman, she couldn't believe it. The hotel—as you of course know—prints a daily newssheet about activities and guests. That day's sheet had printed a picture of 'Sylvester Bonman,' son of the Delian pioneer, who was now traveling to WRU to work further on his prime number theories.

"I realized Sloyd had used the newssheet to begin a *total* impersonation of me. How easy it had been! The robot registered only stowage weight, not individuals. Nobody kept close track of the guests at the busy hotel.

"I decided I would try a similar trick, to help Arla. With my hair covered by the cap, I had a superficial resemblance to Theo, since we both had distinctive blue eyes. I persuaded Arla to return to her room in the employee dormitory, and I boldly walked to the main desk and demanded Theo's key, explaining my battered appearance by saying I had fallen while trying to explore.

"I was accepted as Theo without question. I went to his room and found his identity papers. They were in a bulky folder he had left in his room—apparently not wanting the weight to impede him in his murder attempt. Being really hurt, I stayed at the hotel a week, my head completely bandaged. When I left, to apply for admission to the New Zealand Educational Aggregate, Arla went with me—and we lived happily together for twenty-six years."

Vardos remarked, "A Bard shouldn't cavil when a man sacrifices everything for love—but weren't you concerned about Sloyd's total impersonation of you? What stopped him from selling out all your assets immediately?"

"Oh, I stopped him, myself. I faked a tachyon-Morse message to him at WRU. Tachyon is easy to fake. You black your DM view-sender, program for *deafness* reception—and the

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

receiving screen shows a line of words exactly as if they were tachyoned."

The Bard laughed, "You *are* an inventive rascal! What was your message to Sloyd?"

"*Remember terms of spendthrift trust—Father.* There was no trust, of course, but it put the brake on Sloyd. He lived very much as I would have lived—spending the interest but leaving the capital.

"I frequently tachyoned Wallace in our code—but, of course, he was also in communication with Sloyd, and sometimes messages didn't quite match up. I dared not confide in him—I knew him and my father too well. Not for one moment would they consider the penalties Arla would face—they would have insisted on regaining the property.

"However, it was plain to me that my three murderers were not going to kill the gold goose of Bonmanism, so I didn't worry about the property—or about Berit's arrival, until I saw how beautiful she is. I had pictured her another chip off the old block."

The Bard laughed again, and the physicist went on, "As long as Arla lived, I couldn't quit my masquerade. Besides, Sloyd's career has been fascinating to watch. The situation has been intriguing, challenging. It kept me young—it's been a game. With Wallace's help, I can keep playing it on Delia."

The unit steward interrupted them again. "Emergency Services, Bard Laureate—"

The Bard rose, begged Dillerson to excuse him, and hurried away.

The Emergency Services hexagon looked quiet, but the Security officer was waiting for Vardos. "Callridge is dead," he began, low-key. "A peculiar murder." He led Vardos to the clinic wedge to the wedge where Callridge had been installed.

Hexagon wedges were built as mirror-image pairs, so that the wiring for two wedges could run along one bulkhead. This meant that the entry panels also were mirror-image—either adjacent at the same corner, or at opposing corners and consequently out of line-of-sight. Callridge had been in one of the latter-type pairs. It had been easy for the murderer to slip into the entry around the hexagon corner.

The Security officer motioned to the life-support system in the unused wedge. Callridge's system would be on the other side of the bulkhead. At first Vardos could see nothing wrong, but then he glimpsed a half-hidden horseshoe magnet arched over the power cable, directly against the bulkhead.

"The magnetism caused incorrect readings in Callridge's system, without triggering the alarm for disfunction," explained the officer. "He died before the monitoring medic became aware of what was wrong." The officer went on, "A magnet! What sort of mentality would think of a magnet!"

A mentality that had traveled space as a teen-ager, thought Vardos. The hobby workshops had magnets, and so did the schoolroom lockers. For all

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

his calm demeanor with Callridge, Sloyd had known who had constructed the letter bomb, and he had remembered the magnets, from all those years ago.

So Callridge would be crossed off the Colonel's list. Vardos still had the blue message sheet in his hand. The Colonel, working overtime, would be breathing small puffs of steam at his Guardian's delay in answering.

Vardos decided to tachyon from Main Communications, on the starship bridge. He spiralled topside, threaded his way forward, past salons busy with glee club tryouts—dance groups—amateur theatricals—and came to a door labeled *No Admittance.* At the side of the door were identification slots, *Starships* and *Spaceports.* Vardos pressed his thumb in the *Spaceports* slot. The door slid back, and he stepped into the bridge.

It was like stepping into outer space itself. Directly across a transvers corridor was the Command Bridge, entirely encircled by viewscreens—by soft, glowing darkness and bright starpoints. Because the starship was ambling at dead slow to Vesta, none of the points was blurred. Now using the Dillerson Factor, the ship pointed like an arrow to Vesta and its glittering neighborhood of axle-and-collar merry-go-rounds.

Gray sweeps rhythmically traveled across the dark-glowing viewscreens, now and then leaving a bright splatter which marked where the starships's "scouring beam" had encountered and atomized meteors or space debris.

The Asteroid neighborhoods complained that the atomizing created a particle-smog that gummed and pitted space structures. However, the Asteroids had so much particle-smog anyhow that the complaints went disregarded.

Main Communications was portside of Command. It was, thought Vardos, like a concert stage where a symphony orchestra was arranged on a semicircle of rising platforms, with the conductor at a desk in the lower center. The orchestra was robot consoles, the conductor was human, and the backdrop was a deck-by-deck diagram, each DM-unit represented by a light-dot.

The diagram was winking normally—white lights for inter-cabin calls, an occasional green for the tachyon beam, no Emergency reds.

The watch officer at the desk looked around and smiled at Vardos, "Dhaulagiri is still on Hold. You can take the call at the scrambler tube."

Vardos had been scanning the bulkhead diagrams. He noted a tachyon-green within his own section. He gestured to it and asked, "A Bonmanite message?"

The watch officer tapped buttons on his desk. "Theo Dillerson."

"May I have a Replay on your monitor?"

The officer obliged. The message was to Wallace Bonman on Delia. The Bard remembered Dillerson saying he frequently tachyoned his brother in his true identity as Sylvester. The message was an abstruse spate of

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

For the science-fiction fan who finishes a novel only to wonder what happens next. . .

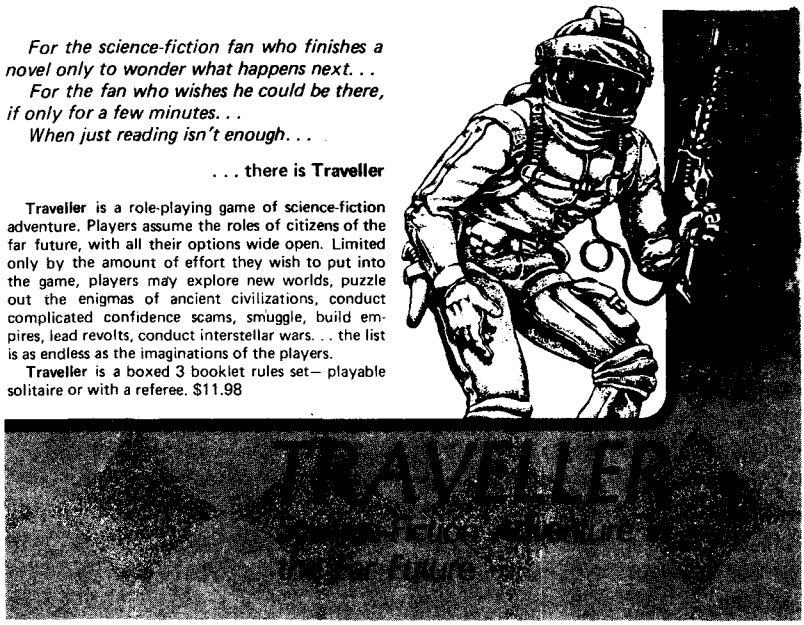
For the fan who wishes he could be there, if only for a few minutes. . .

When just reading isn't enough. . .

. . . there is Traveller

Traveller is a role-playing game of science-fiction adventure. Players assume the roles of citizens of the far future, with all their options wide open. Limited only by the amount of effort they wish to put into the game, players may explore new worlds, puzzle out the enigmas of ancient civilizations, conduct complicated confidence scams, smuggle, build empires, lead revolts, conduct interstellar wars. . . the list is as endless as the imaginations of the players.

Traveller is a boxed 3 booklet rules set— playable solitaire or with a referee. $11.98



DOUBLE STAR— In a binary star system, the pressures of growth and expansion lead to war between two colonies of Earth. **Double Star** is a game of this war, fought as planets whirl in their orbits and fleets fight between worlds. Long-range planning allows small moons to be pulled from orbit and hurled at enemy worlds; special training rules allow the use of formations by fleets, with great effect on firepower and defense. Limited industrial output, orbital fighters, planetary defense systems, and populations. Boxed, $9.98.

SNAPSHOT— As the small free trader *Beowulf* jumps between the stars, one of the passengers secretly assembles a concealed pistol, and slowly works his way to the bridge. Just as the hijacking begins, the computer kicks in: doors slam shut and seal off the ship's vital areas. This time, the hijacking is foiled. *Next time?* **Snapshot** is a game of close combat — be it hijacking, mutiny, or boarding parties — aboard the starships of the far future. All manner of weapons and all types of individuals are included, as well as detailed starship plans. Boxed, $7.98.

BELTER— Against a background of frantic prospecting (for the wealth of the asteroids is why people are here), **Belter** is a political/economic game of many levels. Represented are individual players, as well as groups of crewmen, prospectors, thugs and troops. . . all with their own abilities and goals. Players must manipulate this population as they seek both economic and political power. More than a simple boardgame, **Belter** introduces elements of role-playing and imagination. Realistic constraints (supply and demand, supervised elections, physical violence) shape the course of the game. Boxed, $11.98.

IMPERIUM— The Terran Confederation, having expanded beyond the solar system to the near stars, has encountered an immense interstellar empire, the **Imperium**, which now actively resists Terran expansion. The game begins with the first war between these forces. Each game continues where the last war left off, drawing and redrawing the Imperial borders, until one side has been swept from the board. Voted *Best New Game of 1977.* Boxed, $9.98.

All above science-fiction games are boxed, and each contains a game map showing the location in contention, die-cut counters to represent ships, people, forces and equipment, and rules governing play. **Traveller** contains three 48 page rules booklets only. For more information on these and other GDW science-fiction games, write for our free SF flyer. All of these games are available through hobby and game shops, or direct (and postpaid in the US and Canada) from

GDW

Department A2
203 North Street
Normal, Illinois 61761

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

numbers. No names were spelled out, but Vardos guessed that Dillerson at last was confiding his secret to Wallace. Why, at this particular time and in advance of his own plans? Because Callridge had recognized him, reflected Vardos. He would wonder if Sloyd also knew who he was—in which case he would feel in jeopardy and hasten to inform Wallace of his plans for his half of the valley.

The watch officer smiled at the code and commented, "Dhaulagiri will have to be good, to crack *that*!"

"Oh, we're not interested in the content," smiled Vardos. "Dillerson happened to mention the code, and I wondered what it looked like."

"How come Dillerson is tachyoning code to Bonman's brother? Funny, the way the university crowd know each other."

"And the starship jockeys?" smiled Vardos.

The officer laughed.

A red light winked on the diagram, from the restricted bridge section. "Passenger wanting admittance," muttered the officer, resetting the monitor.

The tube flipped to Visual—and Sloyd/Bonman was peering at them in vague indignation. "I wish to talk to the Bard Laureate."

Replying on Audio, the officer said smoothly, "The Bard is not on the bridge, sir."

"Yes, he is!" insisted the professor. "Several people noticed him coming along the corridor—couldn't mistake that Thespian jumpsuit—"

"One moment, sir."

The officer clicked off the Audio and eyed the Bard's gold-spangled costume. "Hasn't anybody told you the basics of plainclothes work?"

"But I'm not supposed to be working," grinned Vardos. He added, "Where can I confer with Bonman? He tends to have bombs in his pockets."

"Dhaulagiri is still on Hold," reminded the officer.

"They can chew the carpet a few more minutes."

"Well, take Bonman to the serving pantry, portside. It's steel-isolated on account of the food grills."

As Vardos retraced his steps, heavy panels slid shut, locking off the bridge departments. He stood at the entry, pressed his thumb into the Admittance slot—and the professor bumbled into the corridor.

"Just walk ahead of me—to port—the small pantry—"

Vardos steered him, from a pace behind his elbow. They entered the small steel cubicle. Vardos closed the panel and waved the professor to the messman's high three-legged stool.

Sloyd/Bonman perched uncertainly. "All this has been a tremendous shock—tremendous," he began. "They've just now told me Callridge died—"

"Oh? I'm sorry to hear it. What can I do for you, professor?"

"I'm naturally interested in all of the details—"

"Deaths are never discussed on starships because of the morale fac-

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

tor," said Vardos smoothly.

"But surely the cause—I was not told the cause—"

"You witnessed the heart attack, professor. What more details are necessary?"

Vardos saw that Sloyd found the question embarrassing. He dared not probe deeper into the fate of the magnet. He pursued. "May I view my old friend?"

"His body has certainly been removed for cremation and space-dispersal. Starships don't mean to be callous, but they must keep clinic facilities for the living."

"Yes—yes—" Bonman shifted on the perch. Another point seemed to be bothering him. "I was very uneasy, Bard—very—to find Theo Dillerson worming his way into my enclave this evening. He is a distinguished man, of course, but somehow he has a look I don't quite trust."

"Oh, I daresay Dillerson is perfectly trustworthy."

Sloyd gelatinous glance seemed hooded. He dared not probe further.

Vardos asked, "Do you still intend to disembark at Vesta?"

"Yes. I'm obviously in danger, and I have a duty to my Society." Sloyd's role-playing suddenly seemed to come to life. "*I* created Bonmanism—a thought-revolution—a value to mankind. Whatever I've done, my existence has been *justified*—"

Vardos realized he had been taken over by the impersonation. Callridge and Hakluyt had merely spent the stolen income, but Sloyd had attempted to steal genius—and had been captured. From the time he had entered WRU as Syl Bonman, he had been a slave to the drive to invent, to create—and had surprised himself by creating what seemed to be a new thought-process.

Vardos paused to weigh future action. Any action at all seemed unsatisfactory. He could probably set a lethal trap in the clinic wedge and con Sloyd into triggering it by touching the magnet, but Sloyd's death seemed pointless as long as Hakluyt was free on Earth. The Security assignment had straggled into loose ends—and he was as far as ever from finding out what Bonmanism was.

However, Sloyd could not be allowed to wander around the starship. Vardos said, "Since you feel in danger, Professor Bonman, I'll escort you to your cubicle and call a guard to keep the entry under surveillance."

"What! Enter Vesta a prisoner?"

"Either a prisoner or a corpse," said Vardos, feeling weary.

"Yes—well-alright," agreed Sloyd, slipping heavily from the stool.

Vardos mistrusted his docility. Why had Sloyd sought him out? To get information—or to play another scene? He felt as if he were onstage without a script or any idea of the plot.

He motioned Sloyd to precede him from the pantry. They retraced their steps to the admissions door and were let out. Sloyd continued along the topside path to the central Emergency hexagon. Vardos had not expected

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

him to take that direction.

Even a starship has different paths and pastures for different groups. The continuous corkscrew spiral past the Emergency hexagons was the quickest vertical route through the middle of the starship, but it was almost exclusively a crew route. Passengers could use it if they wanted to—and the younger ones like the corkscrew shortcut—but generally the traffic drifted in easy stages along the split-levels and roomier single-deck spirals.

Under No Fault law, an individual had to take full responsibility for his actions. If a passenger stumbled and fell on the long corkscrew, he could not sue the starship.

Thus Vardos would have expected a middle-aged professor to return to his section via a more comfortable, if more circuitous route.

Sloyd paused at the top of the spiral, took out his handkerchief, mopped his brow, returned the handkerchief to a back pocket of his baggy jumpsuit—and stared at a point beyond Vardos' shoulder. "Good heavens—!"

Vardos did not turn, nor take his glance from Sloyd's arrested movement. "It's no good, Sloyd. I've heard of murderers using the same method twice—but *your* method didn't work the *first* time."

The professor hastily tucked away the handkerchief. Pale anger bloated his countenance. "The cheat—the scoundrel!" he said indignantly. "Oh, he was a deceitful one, Syl Bonman! Pretending to confide his notes on the starship—and keeping the warp factor to himself! And cheating us out of the property all those years! We thought his father was ordering the bank audits and scaring us with investigations—and it was only Sylvester, who had turned himself into a redhead from Waystation Four! Why, when I recognized him—when Callridge caved in, and I thought 'Syl dropped the same way at Dhaulagiri'—and it dawned on me that Syl was *standing there*—that I had shaken hands with him—!" Sloyd was completely overcome. "I felt like a fool, for not guessing—! The world never has produced two such inventive geniuses in a generation. How many generations between Isaac Watts and Thomas Edison? Many times I thought that if Syl had lived, he would have been like Dillerson. And he *had* lived—and *was* Dillerson—and even had the nerve to butt in on my private enclave—my Bonmanism! Why didn't he speak up sooner! Callridge nearly killed me by putting a charge in the letter bomb! He swore he didn't, of course, but he was the one who made the bombs—one for me to show, and one to be found in Hakluyt's dressing case. And Hakluyt *cancelled*!"

"What became of the dressing case?" interrupted Vardos.

"Why, it remained on Earth."

And Hakluyt blew himself up when he unpacked it, thought Vardos. Two down. A nice, friendly triumvirate. Imperial Rome had not seen worse backstabbing. But what was he to do

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

with Sloyd?

The professor was mopping his brow again. "To think that Syl even told you my name—! Don't deny it—only Syl could have told you—"

He tucked the handkerchief away, ripped out a small tack hammer and slashed at the Bard's head.

Vardos acted instinctively. He swung away from the blow and then drove a powerful fist into Sloyd's solar plexus.

The body crashed over the guardrail and somersaulted down the spiral, head cracking against steel steps. Over and over, tumbling like a sack of clothes with a dangling, flopping skull, until it jammed at a lower landing.

The hammer had fallen at Vardos' feet. He picked it up and put it in his pocket, reminding himself to return it to the hobby room from which Sloyd had stolen it, and he slowly walked down the steps to join the Emergency medic who was bending over the lifeless professor.

The assignment had fitted together, after all. Only a few loose ends to tie neatly—the Dhaulagiri call—the enclave—an explanation of what Bonmanism *was*—!

Vardos went first to Dillerson's wedge and knocked. This time the physicist asked cautiously through the voice grid, "Who is it, please?"

"The danger's past. The villains, by themselves, each helping each, snuffed out their inner lights, and sank to blackness more profound than death! What claim have they on Him who new-forms stars, from worthless dust...?"

"Bard Laureate!" The physicist again popped from the entry. "Is Sloyd no more? What about Hakluyt?"

"If I may use your DM, we will find out."

"Certainly—certainly!"

Dillerson withdrew and Vardos came into the wedge, kicked off his boots and settled at the head of the bunk. His host sat at the foot. In a hexagon wedge, two was company.

Vardos buzzed Main Communications and requested the Dhaulagiri message to be relayed. After a moment came, WHY THE BAR DREAMING DELAY? THAT'S B.A.R.D. DREAMING, YOU STUPID ROBOTS...H.A.K.L.U.Y.T. DIED FROM BOOBYTRAP...UNLESS YOU STOP TAKING BOWS AND BEGIN WORKING...

Vardos cut the sending and spoke/spelled, BONMAN AND CALLRIDGE ELIMINATED... ASSIGNMENT COMPLETED... MOTIVE GAIN AS YOURS TRULY DEDUCED...DISEMBARKING VESTA...BOUND CENTENNIAL ...CHEERS...VARDOS.

He smiled, clicked off the DM and said to Dillerson, "The Bonman enclave is yours."

"And sooner than I had supposed."

Vardos pointed out, "Berit will be upset by the death of the man she thinks is her uncle. You'll have to break the news gently."

Dillerson pulled at his beard. "You

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

can seek out the young people on the Transient deck and break the news."

"Me! Why me?"

"Because Marvin will never win Berit unless he stops gosh-and-gollying. A few hours of watching your technique—"

"I wouldn't mind being an instructive example all the way to Trail Blazer," grinned Vardos.

"Brother Wallace would mind it very much. A Bard/Thespian as a son-in-law—!"

Since the starships coordinated their clocks with the spaceports—in space, time is as long as a piece of string—matins were also ringing in the Tourist Reception dome on Vesta when Vardos disembarked from the Waystation One shuttle.

He saw his luggage safely into the Transport Tunnel and took a flyover car to the Pleasure Dome. He had retained his cubicle in Thespian Quarters at the Palace. Another troupe was now playing the Palace, of course, but Thespian Quarters usually had a spare cubicle for a visiting "professional."

He hadn't locked the door when he had left, so he opened it and ambled in.

The room was now occupied. A plumpish, elegantly-groomed middle-aged man in a heavy silk dressing gown was sitting in the cubicle's only chair, watching the morning news on the DM tube.

"Great Hurok, George!" exclaimed the Bard, dropping onto the bunk. "What are you doing here?"

"Saving hotel bills," replied George Apfelstein, clicking off the DM. "Why should we pay for two rooms when you are gallivanting somewhere? You got the killer that erased the Bonman bosses—or shouldn't I ask?"

"Yes and no." Vardos slumped against the bunk pillows. "I never *did* find out what Bonmanism is."

"You need to ask?" reproached his manager. "Bonmanism simply claims that letters and numbers are a duplication of effort. Language would be more exact if expressed in numbers."

"Mnph?"

"Now, suppose I should describe that jumpsuit—which, frankly, I wouldn't put on a dog of a critic. To say 'gold stars' gives only an approximate idea. How do I know my listener's idea of 'gold color'? But if I place the color mathematically with the visible spectrum—"

"Ugnph!"

"Well, you can't get away from the advantage of *precision*. We already buy products in metric lengths, weights, and volumes. Why not have the same exactitude about color and other physical properties?

"Naturally," continued Apfelstein, "when you ask a friend how he feels, you don't want an answer in pulse, blood pressure, cell count—"

A peaceful snore came from the bunk.

"A scientific brain, Vardos is not. However, a Bard shouldn't have more education than it takes to rhyme Moon and June," said George Apfelstein. ■

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

is the **UNIVERSE** *a yo-yo?*

Is the universe open or closed, once-and-forever or cyclic? That is the question . . .

Near the beginning of this century, it was determined that the universe is expanding. The galaxies are seperating from each other much like ink spots on a swelling balloon, and the further a galaxy is from Earth, the more rapidly it is moving away from Earth. This fact appears as the famed "red shift," the dopplering of a galaxy's light toward the red end of the spectrum. The red shift is explained most easily by movement away from the viewer; because the red shift increases with distance, we conclude that more distant galaxies are receding from us more rapidly. It is as if new "space" were constantly being created between the galaxies. (Figure 1: Hubble's law.) The source of the expansion has been deduced by plotting the movements of the galaxies backward in time. When this is done, it emerges that some 19 billion years ago, all the matter in the universe occupied a single point, called the "monobloc"—or, put another way, in the beginning the universe was uniformly occupied by matter; there was no "space" and there was no outer edge to the distribution of matter any more than there is today; the universe was much smaller than it is today; it was, in fact, solid matter. At this time, the expansion of the universe began as the proverbial "big bang"; the monobloc exploded. The big bang was not, however, an explosion of matter, like a chemical or atomic bomb. It was rather an explosion of space accompanied by high temperatures and extreme turbulence.

The big bang hypothesis of the universe's origin is on pretty firm ground today. In fact, there is actual, direct evidence of it—in 1965, A.A. Penzias and R.W. Wilson found a cosmic background radiation of a type characteristic of a black body at 3 °K, or of an expanding shell of 4500 °K plasma moving away from Earth at a speed of 99.9% of the speed of light. This radiation reaches Earth evenly from all direction in space. The only slight uneveness can be accounted for by the movement of Earth, the Milky Way, and surrounding galaxies along a line through the constellation Leo at a speed of about 600 kilometers per second.

Our beginning is thus known. But what about our end? Will the universe continue to expand forever? Or will

by Thomas A. Easton

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

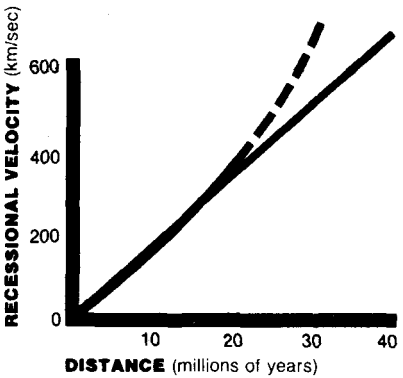


Figure 1: Hubble's law. Distance from Earth and speed away from Earth bear a straight-line relationship. However, since every light-year of distance means that we observe a year into the past, if the universe's expansion is slowing down distant galaxies seem to be receding more rapidly than Hubble's law, as determined for closer galaxies, says they should be (dotted line).

the force of gravity, acting between all the bits of matter in the universe and slowing down their outward movement, eventually halt the expansion and bring about a contraction? The answer depends on just how much matter there is in the universe, and hence on just how great the influence of gravity is. This datum is the object of considerable research effort today, and the various answers arrived at by astronomers have been the cause of vociferous argument.

Theoretical investigations have established that if the universe contains more than a critical value of about 5×10^{-30} grams of matter per cubic centimeter (the equivalent of about three hydrogen atoms per cubic meter), the universe is closed; gravity will eventually counteract the expansion and the universe will contract, presumably into a new monobloc. If the universe contains less than 5×10^{-30} grams of matter per cubic centimeter, it is open and its expansion will continue forever.

Deciding whether the universe is open or closed can be approached in several ways. One of the simplest is to look for deviations from Hubble's law at extreme distances. If a distant galaxy, whose light reaches us millions of years after leaving it (so that we can measure its behavior only in the remote past), has an apparent recessional velocity greater than it should according to Hubble's law, as determined for nearer galaxies and more recent times, then we can measure the deceleration of the universe's expansion that has occurred in the interval. If this deceleration is great enough, the recessional velocity will eventually slow to zero and become negative; the universe is closed. If it is not, the recessional velocity will never reach zero; the universe is open. The best measurements of this deceleration to date indicate that the universe is open.

A more complex way to decide whether the universe is open or closed is to estimate the density of matter in it. This can be done by estimating the masses of galaxies, counting galaxies in a region, figuring the destiny in that region, and then extending the result of this calculation to the universe as a whole. Galactic masses can be esti-

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

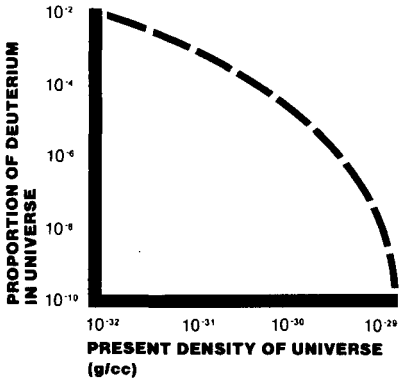


Figure 2: Because of the way the universe was formed, the proportion of deuterium in the universe is related to the present density of the universe. If one of these quantities can be determined, so can the other.

mated by observing the motions of galaxies or clusters of galaxies with respect to other galaxies or clusters and using their separations and velocities to figure their masses; Newtonian physics is all that's necessary. This method includes nonluminescent matter—dust, gas, planets, black holes, comets—within the system being studied. It does not include nonluminescent mass between systems, and it depends critically for accuracy on the assumption that galaxies and clusters are evenly distributed throughout the universe. The best estimates of the universe's density made in this way to date say that it is .04-.12 of the critical value, but recent observations of large amounts of hot gas in the spaces between galaxies and clusters of galaxies may mean the actual density is much higher, since if this gas is evenly distributed throughout the universe it would have little or no gravitational effect on the motions of local concentrations of mass.

A still more complex way to decide whether the universe is open or closed is to go back—conceptually—to the moment of the big bang and work out what happened as the first matter was created from the swarm of protons and neutrons that initially existed (electrons appeared as neutrons decayed into protons and electrons). At first, the density and temperature of the universe were so high that energy could be converted into matter, by the spontaneous appearance of pairs of subatomic particles. Eventually, the density and temperature fell to the point where energy and matter were no longer interconvertible, though thermonuclear fusion still occured freely. Neutrons and protons combined to form deuterons (a deuteron is the neutron-plus-proton nucleus of the isotope of hydrogen called deuterium). Most deuterons fell apart again into neutrons and protons. Some fused to form helium nuclei. Only a small proportion survived the moment of the big bang.

The amount of deuterium produced in the formation of the universe is a function of the temperature and density of the universe at the moment when energy and matter ceased to be fully interconvertible. It is therefore also a function of the present density of the universe and the temperature of the cosmic background radiation

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

(3 °K). Theory produces the graph of Figure 2: Deuterium-density relation, which relates the proportion of deuterium in the present universe to the various possible densities of that present universe. The universe's density can therefore be determined by measuring the abundance of deuterium with a radio telescope tuned to detect the electromagnetic radiation given off by deuterium atoms.

The only trouble with this method is that present-day deuterium does not accurately represent the deuterium formed during the big bang. Deuterium is both produced and consumed by fusion processes within stars. It can also be produced by the decay of radioactive elements and segregated into stars and planets by chemical and gravitational fractionation processes. The exact effects of all these processes on the amount of deuterium observable in the universe are not known for sure, but the theorists believe they have worked out approximate limits for them; they do, however, admit that their range of error may be large.

Just how much deuterium is there in the universe? It is fairly well established that the portion of the universe within a few hundred light years of Earth contains about 15 deuterium atoms per million hydrogen atoms. Beyond that range, the deuterium abundance is less well known. The data do, however, permit a "best guess" of 4×10^{-31} gram per cubic centimeter as the density of the universe. This is about a tenth of the critical value needed for closure.

The date—such as they are—agree that the universe will expand forever, eventually running down, decaying into a loose scatter of dust and burned out stars. But this cold fate is aesthetically and philosophically unacceptable to many people. It has no symmetry, no neatness, and it leaves us with that always unanswerable question: "How did it all begin?" Many researchers therefore question the validity of the velocity-red shift relationship— could some of the red shift be due to interstellar and intergalactic gas, dust, and electromagnetic or gravitational fields? Is the universe smaller, and its density greater, than we think? Others look for "hidden mass" such as the intergalactic gas mentioned above, hoping to find enough to close the universe. Still others question the relationship of deuterium abundance to the universe's present density—is more deuterium formed in stars than we now think?

If the skeptics can indeed show that the universe is closed, they will be immensely satisfied. A closed universe will eventually end its expansion and begin to contract. It will fall in upon itself until it reforms the monobloc some 20 billion years from now. The new monobloc will then presumably explode again to form a new universe. The cycle of expansion, contraction, and explosion will then repeat endlessly. Our universe will give rise to another, just as it once arose from a predecessor. There was no beginning and there will be no ending. The present is a point on an endlessly rolling

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

wheel. The universe is, if you will, a three-dimensional yo-yo.

If the universe is indeed closed, the unanswerable question becomes the nature of successive universes. Do they have the same physical laws? (Some physicists suspect they needn't.) Do matter and antimatter universes alternate? (Why should they? On the other hand, why shouldn't they?) Does history repeat itself in each universe? (The Heisenberg Uncertainty Principle should certainly ensure that different universes are independent.)

These questions are properly the stuff of science fiction. A more scientific question—and perhaps a more intriguing one, as well—is just what is the nature of the monobloc itself. Our present knowledge says that it must certainly be a black hole. After all, if a mass only a few times greater than our sun must contract until its gravitational field is so great that not even light can escape, then so must the much greater mass that is the entire universe. But black holes are mysteries. Because no light can escape—the distance from the center of a black hole closer than which all photons are captured and absorbed by the black holes cannot be observed directly. They can be know only through their effects on neighboring objects and through theory. The latter suggests that small black holes, at least, can in a sense "evaporate," but this way of returning the black hole's contents to the universe is slow. Black holes of any respectable size have mean lifetimes greater than the age of the universe by far. If the monobloc that gave rise to our universe was only a black hole, how could it ever have exploded in the big bang?

The answer to this question may eventually emerge from another field of physics, not cosmology, but subatomic physics. Investigators in this field spend a great deal of their effort in searching for new subatomic particles. They do so by colliding accelerated particles with each other and with stationary targets. Most recently, investigators at the Fermi National Accelerator Laboratory in Illinois and at the Deutsches Elektronen-Synchrotron in Hamburg, West Germany, have produced the upsilon particle, whose mass is said to be 9.5 billion electron-volts (the energy carried by the accelerated protons and electrons whose collisions yielded the particle). This is the equivalent of *ten* atomic mass units, *ten* protons or neutrons, more than the mass of a beryllium atom. This is a *sub*atomic particle?

Of course it is. Two (or more) massive particles can combine to form a single less massive particle if the mass difference is converted to "binding energy." The mass difference is a measure of how tightly the component particles are bound to each other and of how much energy must be supplied to break them apart. It is one of the delights of subatomic physics that the parts are greater than their sum. Subatomic physics is a piece of the real world where 2 ± 3 *can* equal 1.

What does this have to do with

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

cosmology? The new particles being found in the world's high-energy accelerators have two features that allow us to draw a possible connection with the monobloc. The first is that each new particle found so far has been about three times as large as its predecessor, and there is no end in sight for the sequence. The next new particle, which will be producible by the generation of accelerators now under construction (exemplified by PEP at Stanford University and PETRA in Hamburg) will have a mass of nearly 30 billion electron-volts, or 30 atomic mass units. The one after that will be three times larger. And the one that might be produced in an accelerator capable of using all the energy in the universe would be the size of the universe. It would be a monobloc. The monobloc, from which our universe arose and into which it may one day contract, may thus be the ultimate subatomic particle.

The second feature of the new particles offers an explanation of the big bang. These particles are highly unstable. Almost as soon as the are formed, they disintegrate into other, more ordinary particles (this disintegration is, in fact, how the new particles are detected). If the monobloc is indeed the ultimate subatomic particle, it therefore cannot last very long. As soon as the universe's contraction brings the monobloc into being, it will disintergrate, or explode, to form a new expanding universe. Because it is a single particle, it is not obliged to obey the same rules of permanency and inaction as a black hole of universal size.

The main trouble with this idea is that it cannot be tested directly. The monobloc, after all, must include everything in the universe, including all possible experimenters, if it is to be formed at all. But there is a corollary to the idea that may be testable. If the three-fold relationship between the masses of successive particles holds all the way from the upsilon to the monobloc, there must be intermediate particles. Some of these intermediates may be formed when black holes reach particular sizes—perhaps very large sizes. And these mini-monoblocs would immediately disintergrate or explode. Their would be highly energetic, and it would seem well worth considering whether such events could provide the vast energies we detect in quasars and the like.

An open universe is a definition of eternity. It has no end. But it must have a beginning of everything be grasped, imagined, conceived, understood? A closed universe, however, suits us better. It is, was, and always will be, and it presents us only with the problem of accepting that there was no beginning. (If this doesn't sound familiar, check with your local minister.) And it may compensate for this problem by letting us see the essential unity of nature, by letting us identify events on the largest possible scale with events on the smallest. If the universe is closed, it has a satisfying symmetry. It has a neatness such as we have so far found only in works of art. ■

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

ANTIMATTER

Does antimatter really exist outside of physics labs and science fiction stories?

by John Cramer

Consider this: The ship descended silently on its antigravity drive until it hovered a few centimeters above the surface of the airless planet. The astronaut in his bulky suit climbed ponderously down the ladder, carrying the flag of the United Federation of Planets in one hand. As he stepped out over the surface of the planet, he began to recite the ritual phrase, "That's one small step for a man, and..." His foot made contact with the planet.

Finally the ball of radioactive fire thinned enough to make it possible to see the place where the ship had been. An enormous new crater, still glowing with incandescence at the center, now scarred the surface of the antiplanet. Man had found antimatter.

It could happen someday. But where *is* the antimatter? We know that antimatter can be made in the laboratory. Using accelerated particles or gamma rays with enough energy, we can make electrons and positrons (antimatter electrons) in pairs. With more energy we can make proton-antiproton pairs or neutron-antineutron pairs. Notice that in these processes we must always make a matter particle along with the antimatter particle. When the matter around us was made (perhaps in the Big Bang) some antimatter should have been made at the same time. So why do we see no antimatter in nature, not even in cosmic rays? Where can it be hiding? Are there antimatter meteors? Antiplanets? Antistars? Antigalaxies? Are there antimatter life-forms? Antipeople? Anticivilizations?

To understand the full implications of these questions we must first understand what antimatter is and how it relates to ordinary garden variety matter. Fig. 1a shows a schematic view of an atom of ordinary hydrogen, the simplest atom of all. A hydrogen atom has a positively charg-

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

ed proton at its "nucleus" at the center (like a sun in a solar system) and a negatively charged electron orbiting around the proton (like a planet around the sun). The charge of the electron is equal and opposite that of the proton, but the mass of the electron is only 1/1836 of the proton's mass (for comparison, Jupiter has 1/1047 of the sun's mass). Fig. 1b shows carbon-12, a somewhat more typical atom. It has 6 protons and 6 neutrons in its nucleus and a "cloud" of 6 electrons in orbit.

In the corresponding "antihydrogen" atom (Fig. 1c), the central proton is replaced by an antiproton with the same mass as a proton but with a *negative* electric charge. The electron is replaced by a positron with the same mass as an electron with a *positive* charge. Fig. 1d shows an "anticarbon" atom with 6 antiprotons and 6 antineutrons in the nucleus (charge -6) and 6 positrons in the "cloud" (charge +6). These atoms behave the same way as normal hydrogen and carbon, have the same masses, the same chemical properties, the same excited states, resonances, and atomic structure, but the charge of the nucleus is negative and the "cloud" contains positively charged positrons instead of electrons. If the antimatter atoms are completely isolated, their behavior is identical in every way to the equivalent matter atoms. If, however, we place antimatter atoms next to atoms of normal matter, they destroy each other and release a large amount of energy in a process called *annihilation,* which is a spectacularly different story.

Fig. 2a illustrates what happens when an electron and a positron get together. Their annihilation is a miniature explosion in which the charges of the electron and positron cancel, and their combined mass energy (about 1 million electron volts or 1 MeV) is released. Since there are no lighter charged particles to get into the act, this energy is converted into electromagnetic radiation, in the form of a pair of gamma rays (high energy light photons) emitted in opposite directions.

The annihilation of a proton with an antiproton is shown in Fig. 2b. Here the situation is more complicated because there are several kinds of lighter charged particles (pions, muons, and electrons) which can participate. What happens is not nearly as simple as the emission of a pair of back-to-back gamma rays. Instead, about one-third of the time the proton-antiproton anihilation produces a pi-zero meson and two gamma rays, and the other two-thirds of the time a charged (+ or −) pion, a muon (− or +) and a neutrino are produced. I will not dwell on all the games that the pions and muons play, but they are unstable particles which promptly break down into electrons and positrons, photons and neutrinos.

Of the mass-energy released in the proton-antiproton annihilation (1877 MeV), about half ends up as neutrinos, one-third as gamma rays, and one-sixth as energetic electrons and

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

positrons. The energy which goes into gamma rays and electrons is delivered to the surrounding material, if there is any, through electromagnetic interactions. The neutrino energy is effectively lost since the neutrino is not electrically charged, travels at the speed of light, and can pass through light-years of lead or concrete without being stopped or scattered.

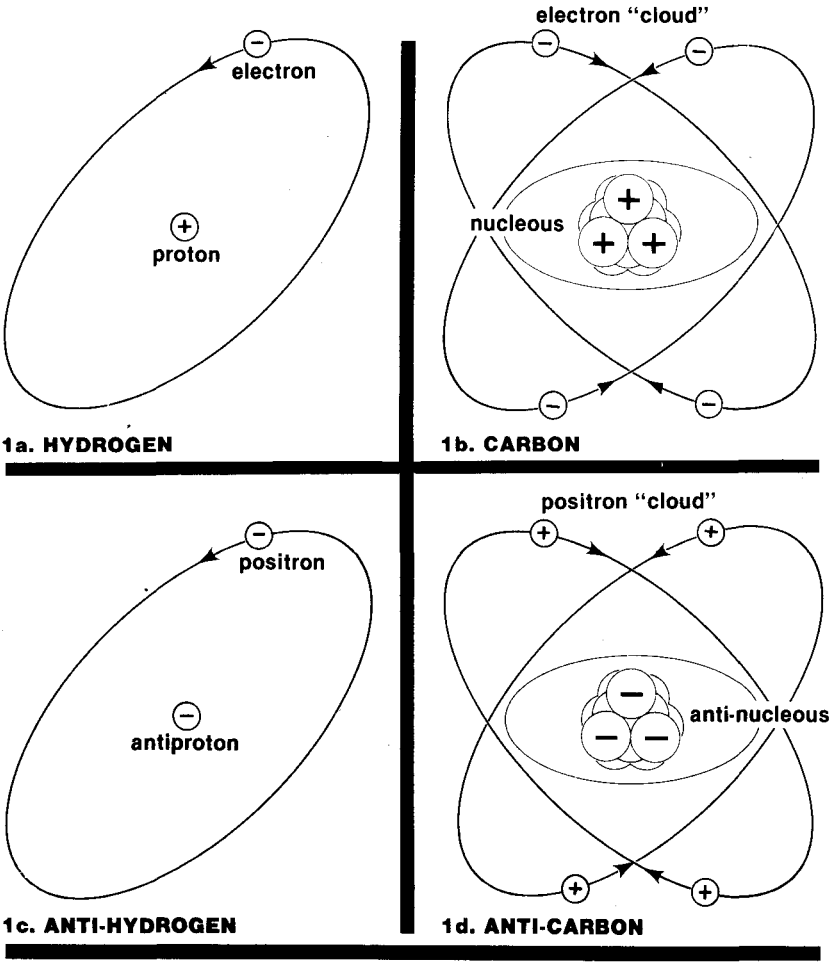


FIGURE 1 *Schematic representation of matter and anti-matter atoms*

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

If larger atoms of matter and antimatter (say carbon + anticarbon) should come into contact, more complicated events can occur, but the result is essentially the same: the total mass of the atom plus antiatom is completely converted into energy, about half in the form of energetic neutrinos and the rest in the form of energetic particles which interact electromagnetically. Here then is the solution to the world's energy problems. Here is energy in its most concentrated form: *mass*. Mass which can be readily converted to energy by annihilation. Small, compact, simple, direct conversion of mass to energy, the realization of Einstein's famous equation $E = mc^2$. What more could you want? As it turns out, you could want a *lot* more.

There are some very formidable (and potentially very dangerous) problems associated with handling antimatter. Suppose someone were to present you with a cube of antimatter one centimeter on a side (or about the size of a sugar cube). If this cube had approximately the density of water, its complete annihilation would produce about 50,000,000 kilowatt-hours of energy (half of it useable). But what would you do with it? You can't hold it in your hand or grab it with tongs or put it down on any surface. It will annihilate with whatever matter it touches and will release enough energy and radiation to kill you leaving a large crater where you were standing.

Suppose you dropped the antimatter cube? Would it fall down or up? You might be tempted to think that since antimatter has a reversed electrical charge, it will also have a reversed gravitational "charge" (which is called negative gravitational mass) and will be pushed away from the Earth by gravity. However, we know from experimental evidence plus the Equivalence Principle from Einstein's general theory of relativity that this is not the case. Antiprotons and positrons are found experimentally to behave quite normally in terms of their inertial mass. A force pushing an antiproton to the right will cause it to accelerate to the right, so its inertial mass is normal. The Equivalence Principle equates inertial mass with gravitational mass, so antimatter particles must also have positive gravitational mass and be attracted toward the Earth by gravity. So you must find a way of supporting your antimatter chunk to keep it from falling downward (not upward). You will have to levitate it using only electric and magnetic fields to insure that there is no physical contact.

There are several ways in which you can do this. If the antimatter material is a reasonable electrical conductor you can use a rapidly varying magnetic field, the antimatter floating on its own induced magnetic field produced by eddy currents. If the antimatter material is a reasonable dielectric (like glass) a rapidly varying electric field can be used to support it. Further, if the chunk of antimatter is hot, (as we will see, it is likely to be) it will probably acquire a negative electrical

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

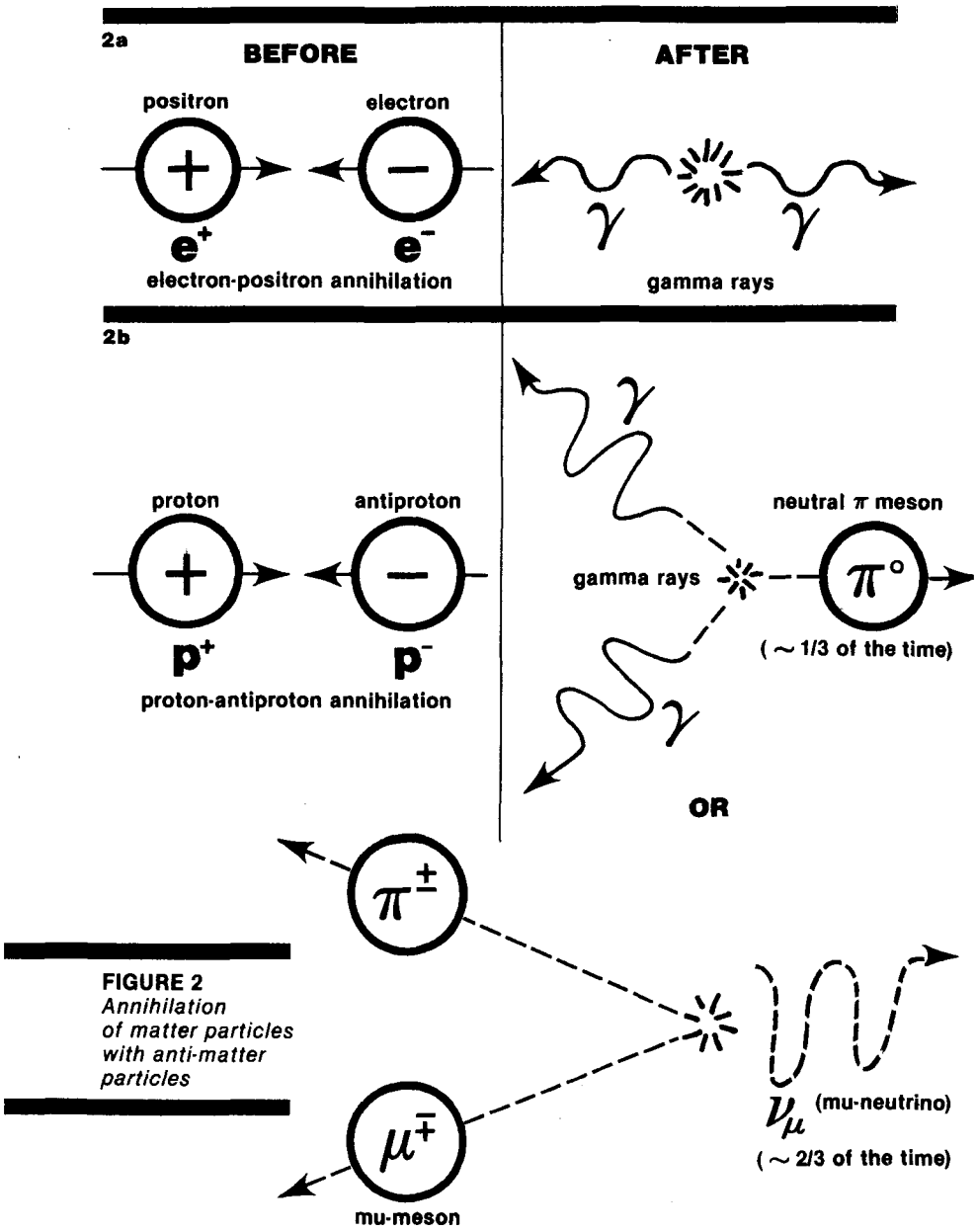


FIGURE 2
Annihilation of matter particles with anti-matter particles

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

charge as it "boils off" positrons (just as the hot cathode of a vacuum tube boils off electrons). Therefore it could be suspended with static electrical forces between a pair of electrically charged plates, the positive plate above the sample and the negative plate below. So in one way or another you can keep your cube floating in mid-air, supported only by electromagnetic forces and not physically contacting any surface made of normal matter. Unfortunately, this does not prevent all contact with matter.

There still remains the problem of contact with gas molecules. If you were to attempt to keep the antimatter cube in air it would literally explode like a bomb because of the energy released by annihilation with air molecules. Now suppose that you place it in a relatively good vacuum, say 10^{-6} torr (about one-billionth of atmospheric pressure). At this pressure the annihilation of the cube with the residual gas molecules in the vacuum would release energy at the rate of about 20 million joules per second or 20 megawatts, about the output of a small power plant. This energy would be mostly in the form of energetic gamma rays. It would be quite lethal to anyone within about a mile of it.

You could make the vacuum better, say 10^{-9} torr. The rate of energy release would then be only 20 kilowatts. If the vacuum were made really superb, say 10^{-11} torr, then only about 200 watts of annihilation energy would be dissipated or about the equivalent of two light bulbs. This seems to be a modest power level, but you must remember that this is 200 watts of energetic gamma rays, not heat. That is enough radiation to make your white corpuscles roll over on their backs and put their little legs in the air. You are making gamma rays with an average energy of 200 MeV each, about 2 trillion of them per second. Clearly, even if your chunk of antimatter is levitated and placed in a superb vacuum it will still be an enormous radiation hazard and would have to be shielded with very large slabs of lead or concrete.

On the other hand, we have the makings of a power plant. All we have to do is contain the antimatter, support it, shield it, and control the vacuum to regulate the amount of power we want to take from it. There would still be some engineering details to be worked out such as the conversion of the released energy to electricity. But the design should be very similar to that of a nuclear reactor. I won't go into the safety aspects of such a device, but at least there should be no hassle over waste disposal!

In addition to the energy-production implications of having a chunk of antimatter available, nuclear and particle physicists would stand in a line several miles long for the opportunity of having it available for physics experiments. The forces which act between nuclear particles could be probed in important new ways if such stuff were available. We would be able to look at the problems of nuclear

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

physics from a completely different perspective and new and exciting results would surely follow.

Our major problem is to find some antimatter. Where should we look? We already know something about where antimatter *cannot* be found. Clearly there is no antimatter on Earth. There has been some speculation that some of the large craters on the surface of the Earth such as the Great Meteor Crater in Siberia might have been made by an antimatter meteor, but little real evidence supports this idea. Even if it were so, none of the antimatter would be left around there by now.

Could a planet or asteroid in the solar system be made of antimatter? It is very likely that there is no antimatter at all in the solar system. But how *certain* are we that there is none? We know that the Earth, the Moon, Venus, and Mars are made of ordinary matter because we or our space probes have made physical contact with them and were not annihilated. For the other planets we can answer this question using somewhat less direct data from gamma ray astronomy. An antimatter object of planetary size in the solar system would be the "brightest" gamma ray object in the sky, due to annihilation with protons from the solar wind (protons streaming from the sun). Our present rather crude measurements of the intensities of high energy gamma rays in space cannot be reconciled with any such "bright" objects. A smallish asteroid made of antimatter *might* exist in the solar system, if it were small enough or far enough away from Earth. An antimatter asteroid about the same distance from the sun as Jupiter would have to have a diameter of less than about 150 km (94 miles) or we would have noticed its presence in gamma ray measurements performed in satellites or with high-altitude balloons. As gamma ray measurements in space improve we can expect more and more sensitivity to possible antimatter objects in the solar system. So if an antimatter something *is* out there in our solar system, we should know about it in a few years.

What about antimatter stars? Could Alpha Centauri or one of our other stellar neighbors be made of antimatter? Again we must rely on gamma ray measurements. "Empty" interstellar space is actually not completely empty. There is a certain amount of interstellar gas, mainly hydrogen, between the stars. An antimatter star would react with this gas by annihilation, producing gamma rays. If we assume that the density (and matter type) of gas in the vicinity of nearby stars is the same as that in the solar system, there can be no antistars within about 100 light years of Earth. Otherwise we would have seen the gamma rays from annihilation of the antistar with interstellar gas atoms. Further, the solar wind from such antistars should produce antiprotons which should appear in cosmic rays near the Earth. No cosmic ray antiprotons (as of this writing) have ever been reported.

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

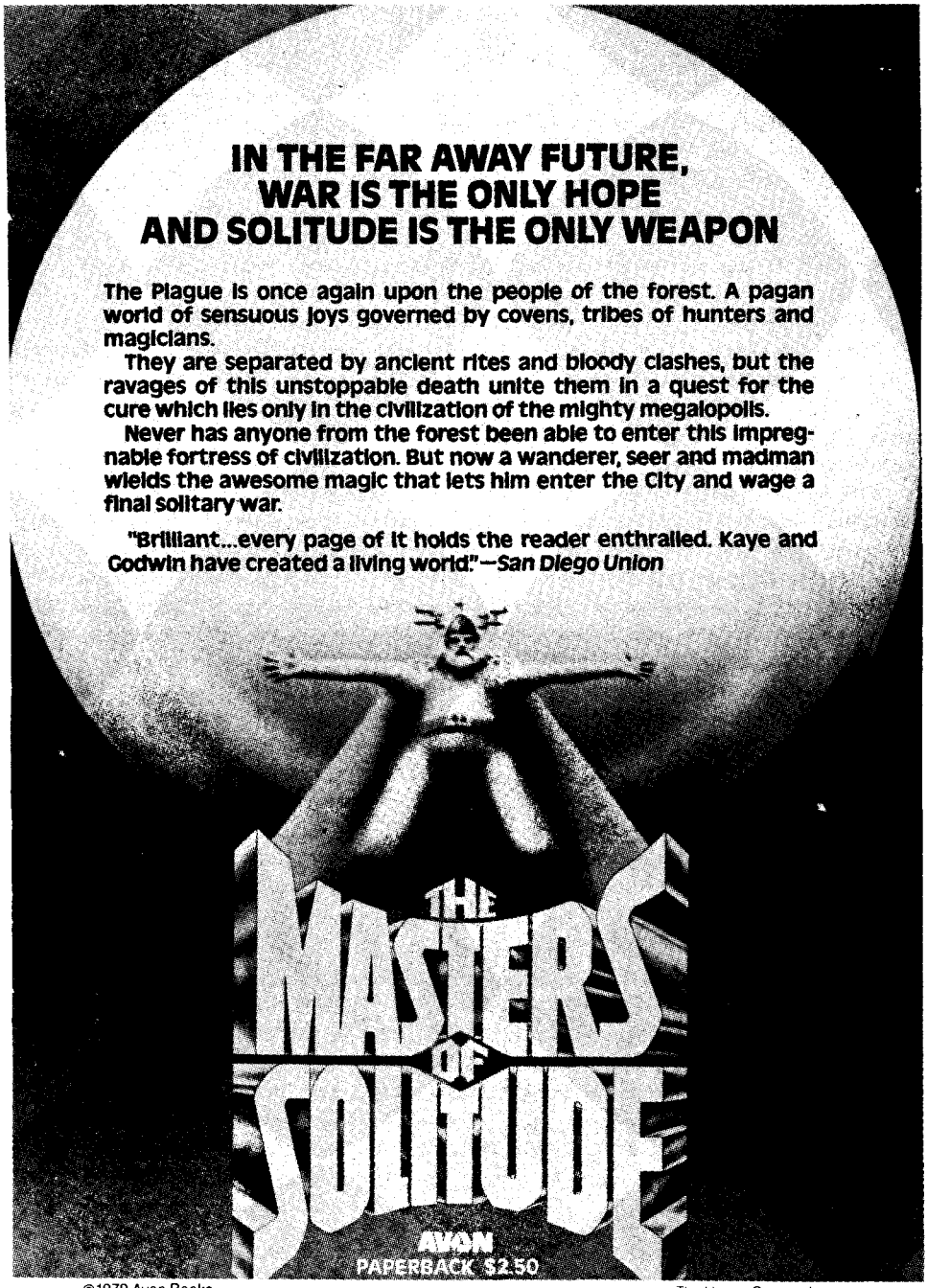
The same gamma ray information can be used in another way. Consider some "average" star in our galaxy, say 30,000 light years from Earth. If one such star were made of antimatter, its annihilation with interstellar gas would not produce enough gamma rays to come to our attention. However, if there were a sufficiently large number of such randomly distributed antistars, their combined gamma rays would reach the level of sensitivity of our detectors. How many such antistars would it take? About 10,000,000 antistars! In other words, our galaxy *could* contain 10 million antimatter stars. This seems to be a very large number, but it is only 1/10,000 of the total number of stars in our galaxy, which has a total "population" of about 100,000,000,000 stars.

Looking beyond our own galaxy to our galactic neighbors, our estimates become considerably more uncertain. This is because we know much less about the gaseous medium between galaxies. If the dilute gas between galaxies is not continuous, it could switch from diffuse hydrogen to diffuse antihydrogen somewhere between one galaxy and the next. On that basis, our sister galaxy M31, the Andromeda Nebula, could be made of antimatter. Similarly, the other minor galaxies in our Local Group might include some antigalaxies. The Virgo Cluster, the next galactic "town" from the Local Group, which contains some 20,000 galaxies, might be all or partly composed of antigalaxies. On the other hand, if there is a pervasive, continuous medium of hot dilute intergalactic gas throughout the region between galaxies (as has been suggested by some astrophysicists) then there can be little antimatter in our galactic neighborhood. Under those circumstances gamma ray data would imply that M31 could have at most one antistar per 1000 stars and the probability that nearby galaxies could be made of antimatter would be only 1/1000.

How could there be so little antimatter around? It implies that the universe is a rather unsymmetrical place, with all the matter in an untidy heap over here and perhaps the antimatter in another heap over there. Or maybe with no antimatter heaps at all. It seems a slapdash way to put together a universe!

Up to this point, our discussion of antimatter has been based on information which is presently available as a result of measurements already done and data already collected. Now let us turn to the future. We haven't found antimatter in nature up to now. This *may* mean there isn't any there, or it may mean that we will have to look harder if we are to find it. A first step would be to improve gamma ray measurements in space, both in their sensitivity and in their directionality. But further, let's consider what else we might be able to learn about the presence of antimatter in the universe if we are clever enough in performing new types of measurements and obtaining new data. Before we can discuss such measurements, however, we must lay

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED


IN THE FAR AWAY FUTURE,
WAR IS THE ONLY HOPE
AND SOLITUDE IS THE ONLY WEAPON
The Plague is once again upon the people of the forest. A pagan world of sensuous joys governed by covens, tribes of hunters and magicians.
They are separated by ancient rites and bloody clashes, but the ravages of this unstoppable death unite them in a quest for the cure which lies only in the civilization of the mighty megalopolis.
Never has anyone from the forest been able to enter this impregnable fortress of civilization. But now a wanderer, seer and madman wields the awesome magic that lets him enter the City and wage a final solitary war.
"Brilliant...every page of it holds the reader enthralled. Kaye and Godwin have created a living world."—San Diego Union
THE MASTERS OF SOLITUDE
AVON
PAPERBACK $2.50

©1979 Avon Books

The Hearst Corporation

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

some background on the fundamental forces of nature and the fundamental symmetries of physical processes.

There are four fundamental forces in the universe which, as far as we know, account for all of the interactions within and between physical systems. These forces, in order of increasing strength, are: the gravitational force, the "weak" nuclear force, the electromagnetic force, and the "strong" nuclear force. The gravitational and electromagnetic forces are the ones with which we have the most familiarity because they are "long range" forces obeying the well-known inverse-square law. The other two forces, weak and strong, are more difficult to study because they are "short-range" forces, and only reveal themselves when the interacting objects such as neutrons and protons are very close together indeed. The strong force holds nuclei together, and without it no nuclei would exist (and neither would we). The weak force is perhaps the most mysterious of the four. Its effects are not readily apparent, except in certain processes involving radioactive decay. However, if the weak force were suddenly to "turn off," the fusion reactions in the sun would cease. The sun would literally "go out." Physicists suspect that the weak force is linked in some way to the electromagnetic force and this is presently the subject of very intensive investigation. The weak force exhibits very peculiar properties, some of which we will discuss below.

Imagine that with a very powerful microscope you are able to watch an "event" involving a physical process such as the interaction of a pair of fundamental particles, say an electron scattering from a proton. You are able to make high-speed movies of what you see. Now suppose that you make a similar film of the same process with antimatter particles (e.g., a positron scattered from an antiproton). You give these two films to a projectionist who will show the films while you watch. Unfortunately, your projectionist is very clumsy and inexperienced. He is quite capable of (1) mixing up the two films, (2) reversing the orientation of the film so that the image you see is the mirror image of the true process, (3) showing the film in reversed time sequence so that it runs backwards. Or he might make any combination of these mistakes at the same time. The question then is: Can you by watching the movie of the event and knowing some physics, tell if your inept projectionist has made one or more of the above mistakes? If, for instance, you can't tell the difference between an event viewed forward and backwards in time sequence, we would say that the process has "time-reversal invariance" or more simply, has T symmetry. Similarly, if we can't tell the matter film from the antimatter film of the same event, then the process which we are viewing is said to have "charge-conjugation invariance" or C symmetry. If the normal film and its mirror image look the same, then the process which we are viewing is said to have "parity in-

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

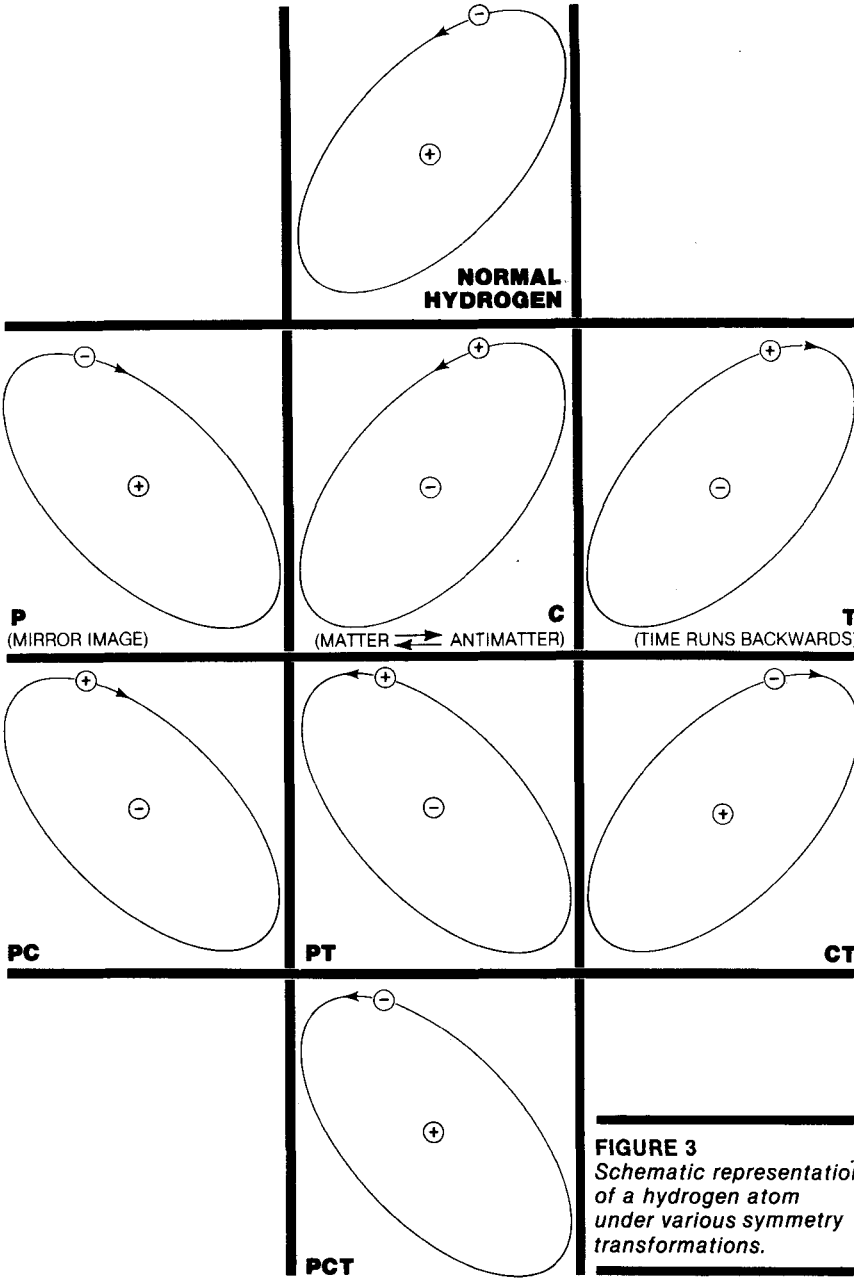


FIGURE 3
Schematic representation of a hydrogen atom under various symmetry transformations.

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

variance" or P symmetry. If we can't tell that both (1) and (2) were done simultaneously, we say that the process has CP symmetry, and so forth. Fig. 3 shows schematically an atom of hydrogen as it appears under these various symmetry operations.

Note that in Fig. 3 we have used the convention that charges are reversed by the T (or time reversal) operation. The subtle arguments which lead to this result are due to Nobel Laureate Richard Feynman, who pointed out in the late 1970s that a positron (antimatter) can be described as an electron (matter) moving backwards in time.

We should note that while microscopic processes may possess some of these symmetries, everyday processes clearly don't. All three symmetries are grossly violated in the events happening all around us. For example, our surroundings are *all* matter and no antimatter, which is a violation of C symmetry. Our bodies are not P symmetric, in that our hearts are on the left side and our mirror image would have a heart on the right. Time clearly runs forward and not backwared in a very non-T-symmetric way, so that a movie of an egg smashing on the floor is clearly distinguishable from the same movie run backwards (whereas, a movie of an electron obiting a proton is not). How symmetric microscopic process can combine to produce unsymmetric microscopic processes is a question which, at this writing, has not been satisfactorally answered in contemporary physics. (But that is the subject for another article.)

Up to 1957 the prevailing view in physics was that *all* microscopic physical processes posessed C symmetry, P symmetry, and T symmetry. *Then the roof fell in!* It was discovered that certain microscopic events involving the "weak" interaction (for example, the kind of radioactivity called beta decay) showed gross violations of P symmetry. They looked quite different in the mirror than they did straight on. Subsequently it was found that these symmetry violations were exactly reversed in antimatter systems, so that both C symmetry and P symmetry were individually violated, but their effects cancelled in such a way that CP symmetry was preserved. In other words, if our clumsy projectionist grabbed a film of antimatter beta decay by mistake and then showed it mirror imaged we would be unable to detect his mistakes and would think we were watching the corresponding matter film shown properly. More recently, even this CP symmetry has been found to be broken in the decay of the neutral K2 meson. The prevailing view in physics now is that only an overall CPT symmetry is preserved in *all* microscopic physical systems. In other words, the antimatter film shown backwards in time sequence and mirror-imaged *must always* be indistinguishable from the matter film shown correctly.

What does all of this have to do with our search for antimatter in the universe? It has two kinds of implications. First, we believe that all microscopic processes possess CPT

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

symmetry. It is therefore at least plausible that there might also be a kind of overall CPT symmetry which applies to the universe as a whole. The apparent dominance of matter over antimatter in the universe could, on this basis, be *required* in order to cancel the unsymmetric directionality of time which is apparent in all macroscopic processes and particularly in the expansion of the universe. Perhaps there is only matter in the universe so that time can have a unique direction. (Or perhaps not.)

My own contribution to the search for antimatter in the universe was to discover a second implication of these symmetry ideas. I realized that the violations of P-symmetry and C-symmetry in "weak" processes could be used as a handle for distinguishing matter for antimatter, and a colleague and I worked out a way in which this might be done even at interstellar or intergalactic distances. Stars start as almost all protons (in the form of hydrogen). They "burn" by a cycle of nuclear fusion, systematically converting more and more of their protons into neutrons. The "weak" processes of positron decay and electron capture are links in the chain of nuclear reactions which make up the fusion cycle. These weak processes violate P symmetry by emitting positrons and secondary gamma rays which have their spin axes pointing along their lines of flight. (Yes, gamma rays do "spin" as they move through space.) In an antimatter system (i.e., an antistar) the spin direction must reverse to preserve CP symmetry.

To understand this in more down-to-earth terms, consider the manufacture of pistols. The barrels of pistols are rifled to spin the bullet as it emerges from the gun, but the manufacturers differ as to which direction of spin is used. In particular, pistols made by the Colt Co. spin their bullets counterclockwise when viewed by an observer looking down the gun barrel (admittedly a very bad vantage point!). On the other hand, pistols made by Smith & Wesson spin their bullets clockwise. Thus if the good guys were shooting Colt's while the bad guys were shooting S&Ws, a clever observer who found himself in the middle of a gunfight could tell the good guys from the bad guys by the spin of their bullets. To complete the analogy, the secondary gamma rays from the weak processes in matter stars spin like bullets from a Colt, while those from antistars spin like bullets from a S&W. In principle therefore, we can tell from observation of the spin of the secondary gamma rays from fusion whether a distant star is made of matter or of antimatter.

This is not as easy as it seems, for in a normal star the fusion reactions occur only very deep in the interior of the star, and the gamma rays can never escape. All stars, however, are not normal. Occasionally a massive star will burn all its hydrogen to helium, all its helium to carbon, all its carbon to silicon, and all its silicon to iron. Iron is the most "bound" nucleus, so the star cannot get more energy either by

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

fusing two iron nuclei or by breaking one apart. Therefore, the star is literally "out of gas," because all of its nuclear fuel has been exhausted, its precarious equilibrium is lost, and it undergoes a catastrophic collapse and explosion called a *supernova.* For a brief time this star outshines the combined output of all the other stars in its galaxy, before it dwindles back to become a neutron star or a black hole. During its brief period of glory there are weak-force processes at work at its surface, liberating most of the observed energy and also making secondary gamma rays. If the material of the supernova is normal matter, these gamma rays will spin counterclockwise and if the supernova is made of antimatter they will spin clockwise. This is our clue.

The energy released in a supernova is so enormous that even if it occurs 3 million light years from Earth, there may be enough of these gamma rays to make it possible to determine their spin direction. The same trick can also be used on a cluster of galaxies such as the Virgo Cluster by collecting the radiation from a number of supernovae in a number of galaxies in the cluster, thus determining whether an object 60 million light-years away is made of antimatter.

Observational measurements such as these are far beyond what can presently be done. After the Space Shuttle begins routine flights, however, such measurements might be feasible. Determination of the spin direction of a gamma ray is done by scattering it from magnetized iron, and the sensitivity is not very high. A hypothetical space-mounted detector would have to be very large and might also have to be surrounded by shielding material such as lead, making for large payloads. The technology for the construction of such a detector is still under development by myself and others. In the context of gamma ray astronomy experiments of this complexity are still a "generation" or more away.

But the limits are being pushed back, day by day and year by year. Perhaps, in the days to come we will see a gamma ray "beacon" telling us that antimatter is being annihilated somewhere in our galaxy. Perhaps experiments to detect high energy neutrinos (which I hadn't the space to mention) will provide similar clues. Perhaps we will one day be able to learn from the death of an almost inconceivably distant star that a faraway galaxy is made of antimatter. Perhaps we can one day stand under the stars and point to the antimatter in the sky. ■

"Observational Tests of Antimatter Cosmologies," G. Steigman, *Annual Reviews of Astronomy and Astrophysics,* Vol. 14, p. 339, (1976).

"Distinguishing between Stars and Galaxies Composed of Matter and Antimatter Using Photon Helicity Detection," John G. Cramer and Wilfred J. Braithwaite, *Physical Review Letters,* Vol. 39, p. 1104, (1977).

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

First, our thanks to all of you who responded to the call for votes on your favorite stories and articles of 1978. There's no perfect way to evaluate them, of course, but the method we used seemed the best compromise with the kind of data we had: a simple totaling of scores calculated at 3 points for a first-place mention, 2 for a second, 1 for a third, and none for any lower place or no mention. (Please note that with this system, unlike the one formerly used in *monthly* An Lab, a *high* score indicates high popularity.)

The results, figured in this way and listed in order beginning with the highest-ranked entry in each category, are as follows.

serials

1. *Stardance II*, Spider and Jeanne Robinson
2. *The Outcasts of Heaven Belt*, Joan D. Vinge

novelettes

1. "Fireship," Joan D. Vinge
2. "Mikal's Songbird," Orson Scott Card
3. "Starships In Whose Future?", Sam Nicholson
4. "Hunter's Moon," Paul Anderson
5. "To Bring In the Steel," Donald Kingsbury

short stories

1. "Lifeloop," Orscon Scott Card
2. "The Great Gray Dolphin," Ben Schumacher
3. "Fixed Price War," Charles Sheffield
4. "View from a Height," Joan D. Vinge
5. "The Man Who Was Heavily Into Revenge," Harlan Ellison

science fact

1. "This Space For Rent," Joe Haldeman
2. "Salute to Salyut," James Oberg
3. "The Disposal of Nuclear Waste In Space: Will It Ever Be Feasible?", Michael McCollum

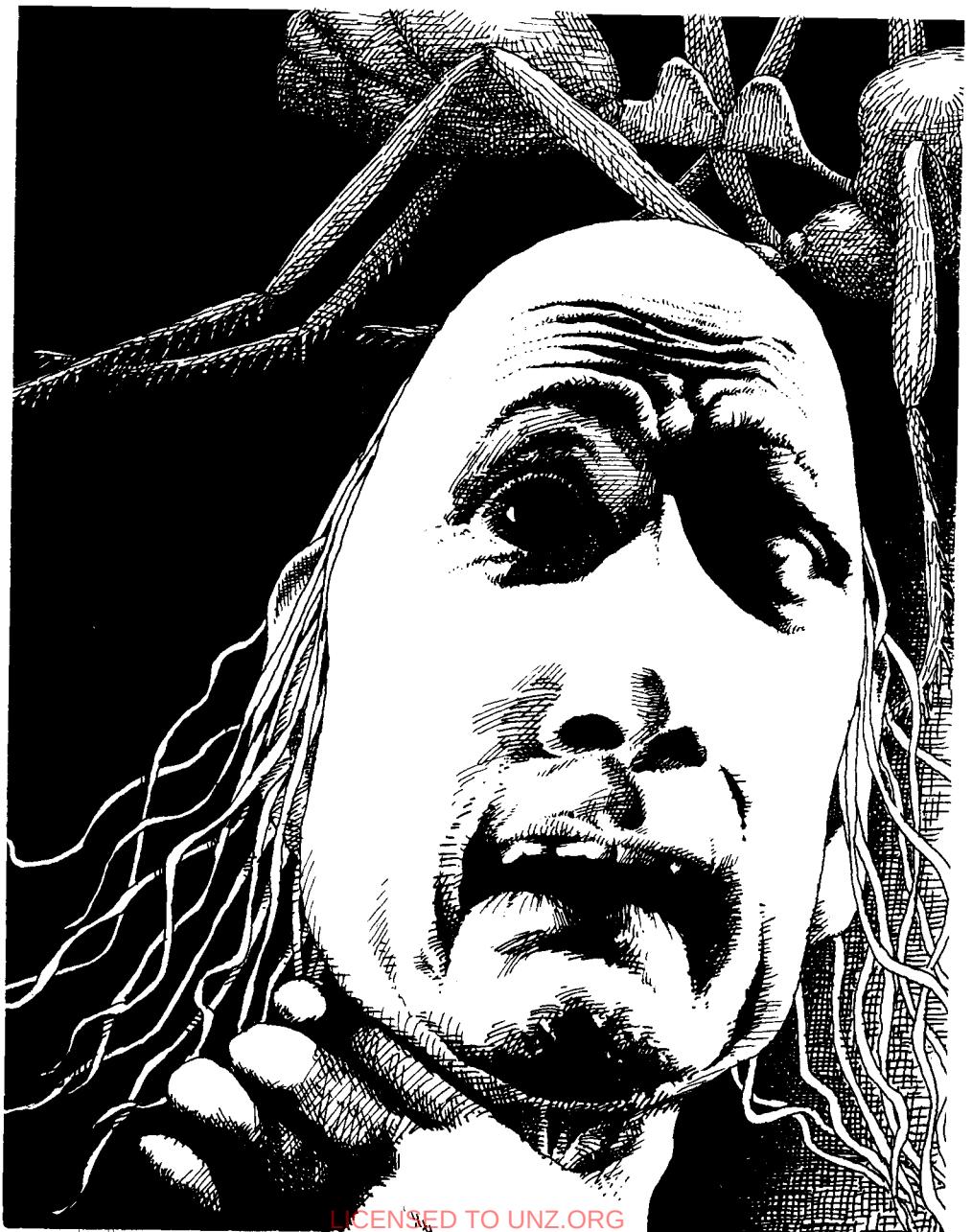
On the question of whether the An Lab should be reinstated as a monthly feature, 47% of those voting said (often emphatically) *yes*, 21% said *no* (for a variety of reasons), and 32% didn't comment. Among those who answered the question, the consensus was clearly in favor of a monthly lab.

But . . .

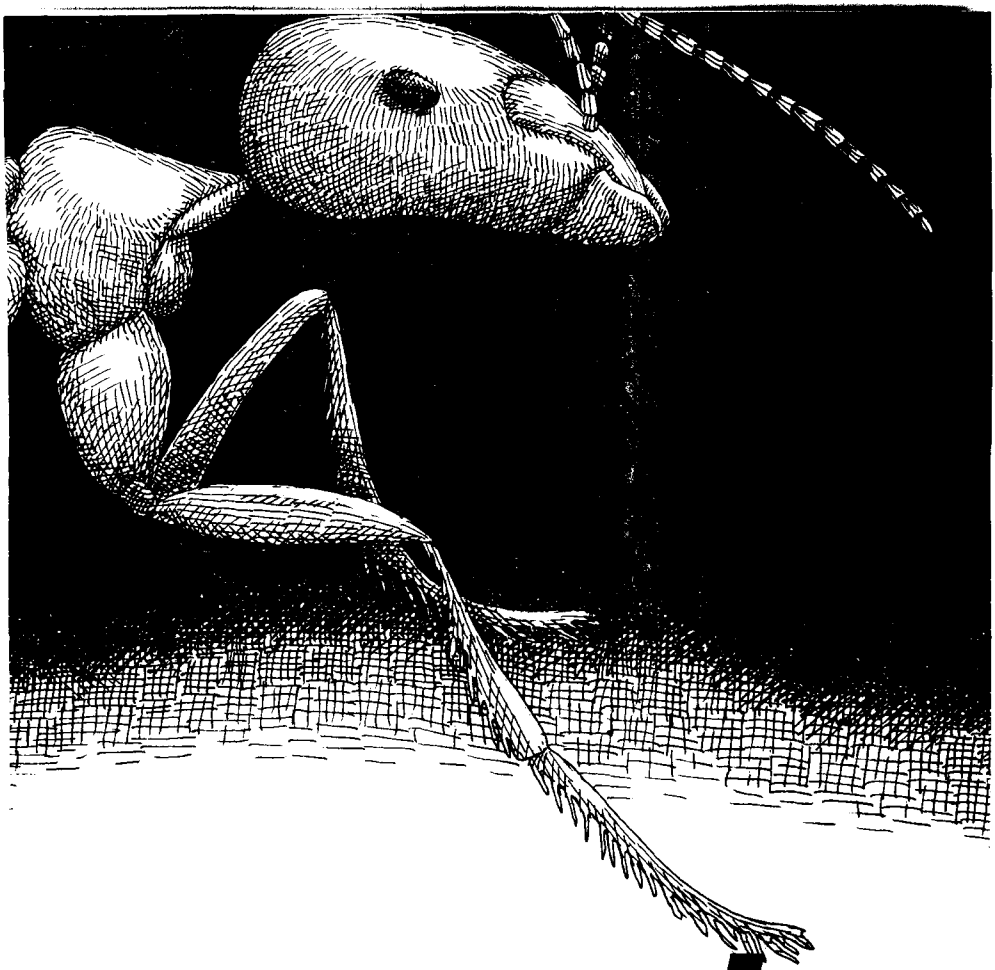
The total number voting was still less than half of one percent of the readership . . . which is not enough to be really useful to either writers or readers. Several people suggested that if a ballot were included in each issue the return might be better, and we *may* give that a try. But, much as some of you (and I) would like to see this become a regular thing again, the chances don't look too encouraging. If the response is this small, even after an announcement that the results of this attempt could help determine whether we went monthly again, we have to strongly suspect that there just aren't enough of you interested to make the An Lab work well.

THE EDITOR

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED



LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED



giants

Nature imposes limitations that no amount of wishful thinking can remove. But sometimes they can be used. . .

by Edward Bryant

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

Paul Chavez looked from the card on the silver plate to O'Hanlon's face and back to the card. "I couldn't find the tray," she said. "Put the thing away maybe twelve years ago and didn't have time to look. Never expected to need it." Her smile folded like parchment and Chavez thought he heard her lips crackle.

He reached out and took the card. Neat black-on-white printing asserted that one Laynie Bridgewell was a bona fide correspondent for the UBC News Billings bureau. He turned the card over. Sloppy cursive script deciphered as: *Imperative* I talk to you about New Mexico Project. "Children of electronic journalism," Chavez said amusedly. He set the card back on the plate. "I suppose I ought to see her in the drawing room—if I were going to see her, which I'm not."

"She's a rather insistent young woman," said O'Hanlon.

Chavez sat stiffly down on the couch. He plaited his fingers and rested the palms on the crown of his head. "It's surely time for my nap. Do be polite."

"Of course, Dr. Chavez," said O'Hanlon, sweeping silently out of the room, gracefully turning as she exited to close the doors of the library.

Pain simmered in the joints of his long bones. Chavez shook two capsules from his omnipresent pill case and poured a glass of water from the carafe on the walnut desk. Dr. Hansen had said it would only get worse. Chavez lay on his side on the couch and felt weary—seventy-two years' weary. He supposed he should have walked down the hall to his bedroom, but there was no need. He slept better here in the library. The hardwood panels and the subdued Mondrian originals soothed him. Endless ranks of books stood vigil.

He loved to watch the wind-blown patterns of the pine boughs beyond the French windows that opened onto the balcony. He also loved to study the colors as sunlight spilled through the leaded DNA double-helix pane Annie had given him three decades before.

Chavez felt the capsules working faster than he had expected. He thought he heard the tap of something hard against glass. But then he was asleep.

In its basics, the dream never changed.

They were there in the desert somewhere between Albuquerque and Alamogordo, all of them: Ben Peterson, the tough cop; the FBI man Robert Graham; Chavez himself; and Patricia Chavez, his beautiful, brainy daughter.

The wind, gusting all afternoon, had picked up; it whistled steadily, atonally, obscuring conversation. Sand sprayed abrasively against their faces. Even the gaunt stands of spiny cholla bowed with the wind.

Patricia had struck off on her own tangent. She struggled up the base of a twenty-foot dune. She began to slip back almost as far as each step advanced her.

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

They all heard it above the wind—the shrill, ululating chitter.

"What the hell is that?" Graham yelled.

Chavez shook his head. He began to run toward Patricia. The sand, the wind, securing the brim of his hat with one hand, all conspired to make his gait clumsy.

The immense antennae rose first above the crest of the dune. For a second, Chavez thought they surely must be branches of windblown cholla. Then the head itself heaved into view, faceted eyes coruscating with changing hues of red and blue. Mandibles larger than a farmer's scythes clicked and clashed. The ant paused, apparently surveying the creatures downslope.

"Look at the size of it," said Chavez, more to himself than to the others.

He heard Peterson's shout. "It's as big as a horse!" He glanced back and saw the policeman running desperately for the car.

Graham's reflexes were almost as prompt. He had pulled his .38 Special from the shoulder holster and swung his arm, motioning Patricia to safety, yelling, "Back, get back!" Patricia began to run from the dune all too slowly, feet slipping on the sand, legs constricted by the ankle-length khaki skirt. Graham fired at the thing again and again, the sun popping dully in the wind.

The ant hesitated only a few seconds longer. The wind sleeked the tufted hair on its purplish green thorax. Then it launched itself down the slope, all six articulated legs churning with awful precision.

Chavez stood momentarily frozen. He heard a coughing stutter from beside his shoulder. Ben Peterson had retrieved a Thompson submachine gun from the auto. Gusts of sand erupted around the advancing ant. The creature never hesitated.

Patricia lost her race in a dozen steps. She screamed once as the crushing mandibles closed around her waist. She looked despairingly at her father. Blood ran from both corners of her mouth.

There was an instant eerie tableau. The Tommy gun fell silent as Peterson let the muzzle fall in disbelief. The hammer of Graham's pistol clicked on a spent cylinder. Chavez cried out.

Uncannily, brutally graceful, the ant wheeled and, still carrying Patricia's body, climbed the slope. It crested the dune and vanished. Its chittering cry remained a moment more before raveling in the wind.

Sand flayed his face as Chavez called out his daughter's name over and over. Someone took his shoulder and shook him, telling him to stop it, to wake up. It wasn't Peterson or Graham.

It was his daughter.

She was his might-have-been daughter.

Concerned expression on her sharp-featured face, she was shaking him by the shoulder. Her eyes were dark brown and enormous. Her hair, straight and cut short, was a lighter

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

brown and healthy looking.

She backed away from him and sat in his worn, leather-covered chair. He saw she was tall and very thin. For a moment he oscillated between dream-orientation and wakefulness. "Patricia?" Chavez said.

She did not answer.

Chavez let his legs slide off the couch and shakily sat up. "Who in the world are you?"

"My name's Layne Bridgewell," said the young woman.

Chavez's mind focused. "Ah, the reporter."

"Correspondent."

"A semantic distinction. No essential difference." One level of his mind noted with amusement that he was articulating well through the confusion. He still didn't know what the hell was going on. He yawned deeply, stretched until a dart of pain cut the movement short, said, "Did you talk Ms. O'Hanlon into letting you up here?"

"Are you kidding?" Bridgewell smiled. "She must be a great watchdog."

"She's known me a long while. How *did* you get up here?"

Bridgewell looked mildly uncomfortable. "I, uh, climbed up."

"Climbed?"

"Up one of the pines. I shinnied up a tree to the balcony. The French doors were unlocked. I saw you inside sleeping, so I came in and waited."

"A criminal offense," said Chavez.

"They were unlocked," she said defensively, gesturing toward the doors with her thin hands.

"I meant sitting and watching me sleep. Terrible invasion of privacy. You know, a person could get awfully upset, not knowing if another human being, a strange one at that, is secretly watching him snore or drool or whatever."

"You slept very quietly," said Bridgewell. "Very still. Until the nightmare."

"Ah," said Chavez. "It was that apparent?"

She nodded. "You seemed really upset. I thought maybe I ought to wake you."

Chavez said, "Did I say anything."

She paused and thought. "Only two words I could make out. A name —Patricia. And you kept saying 'them.'"

"That figures." He smiled. He felt orientation settling around him like familiar wallpaper in a bedroom, or old friends clustering at a departmental cocktail party. "You're from the UBC bureau in Billings?"

"I drove down this morning."

"Work for them long?"

"Almost a year."

"First job?"

She nodded. "First real job."

"You're what—twenty-one?" said Chavez.

"Twenty-two."

"Native of Montana?"

She shook her head. "Kansas."

"University of Southern California?"

Another shake. "Missouri."

"Ah," he said. "Good school."

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

Chavez paused. "You're here on assignment?"

A third shake. "My own time."

"Ah," said Chavez again. "Ambitious. And you want to talk to me about the New Mexico Project?"

Face professionally sober, voice eager, she said, "Very much. I didn't have any idea you lived so close until I read the alumni bulletin from the University of Wyoming."

"I wondered how you found me out." Chavez sighed. "Betrayed by my alma mater..." He looked at her sharply. "I don't grant interviews, even if I occasionally conduct them." He stood and smiled. "Will you be wanting to use the stairs, or would you rather shinny back down the tree?"

"Who is Patricia?" said Bridgewell.

"My daughter," Chavez started to say. "Someone from my past." he said.

"I lost people to the bugs," said Bridgewell quietly. "My parents were in Biloxi at the wrong time. Bees never touched them. The insecticide offensive got them both."

The pain in Chavez's joints became ice needles. He stood—and stared.

Even more quietly, Bridgewell said, "You don't have a daughter. Never had. I did my homework." Her dark eyes seemed even larger. "I don't know everything about the New Mexico Project—that's why I'm here. But I can stitch the rumors together." She paused. "I even had the bureau rent an old print of the movie. I watched it four times yesterday."

Chavez felt the disorientation return, felt exhausted, felt—damn it!—old. He fumbled the container of pain pills out of his trouser pocket, then returned it unopened. "Hungry?" he said.

"You better believe it. I had to leave before breakfast."

"I think we'll get some lunch," said Chavez. "Let's go downtown. Try not to startle Ms. O'Hanlon as we leave."

O'Hanlon had encountered them in the downstairs hall, but reacted only with a poker face. "Would you and the young lady like some lunch, Dr. Chavez?"

"Not today," said Chavez, "but thank you. Ms. Bridgewell and I are going to eat in town."

O'Hanlon regarded him. "Have you got your medicine?"

Chavez patted his trouser leg and nodded.

"And you'll be back before dark?"

"Yes," he said. "Yes. And if I'm not, I'll phone. You're not my mother. I'm older than you."

"Don't be cranky," she said. "Have a pleasant time."

Bridgewell and Chavez paused in front of the old stone house. "Why don't we take my car?" said Bridgewell. "I'll run you back after lunch." She glanced at him. "You're not upset about being driven around by a kid, are you?" He smiled and shook his head. "Okay."

They walked a hundred meters to where her car was pulled off the

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

blacktop and hidden in a stand of spruce trees. It was a weather-beaten Volkswagen beetle of a vintage that Chavez estimated to be a little older than its driver.

As if reading his thoughts, Bridgewell said, "Runs like a watch—the old kind, with hands. Got a hundred and ten thousand on her third engine. I call her Scarlett." The car's color was a dim red like dried clay.

"Do you really miss watches with hands?" said Chavez, opening the passenger-side door.

"I don't know—I guess I hadn't really thought about it. I know I don't miss slide rules."

"*I* miss hands on timepieces." Chavez noticed there were no seat belts. "A long time ago, I stockpiled all the Timexes I'd need for my lifetime."

"Does it really make any difference?"

"I suppose not." Chavez considered that as Bridgewell drove onto the highway and turned downhill.

"You love the past a lot, don't you?"

"I'm nostalgic," said Chavez.

"I think it goes a lot deeper than that."

Silence enveloped both driver and rider. Chevez suspected what she meant by that observation. He wondered how much he *did* talk in his sleep, and how sharply she had noted that double-helix pattern.

Bridgewell handled the VW like a racing Porsche. Chevez held onto the bar screwed onto the glove-box door with both hands. Balding radial tires shrieked as she shot the last curve and they began to descend the slope into Casper. To the east, across the city, they could see a ponderous dirigible-freighter settling gracefully toward a complex of blocks and domes.

"Why," she said, "are they putting a pilot fusion plant squarely in the middle of the biggest coal deposits in the country?"

Chavez shrugged. "When man entered the atomic age he opened a door into a new world. What he may eventually find in that new world no one can predict."

"Huh?" Bridgewell said. Then: "Oh, the movie. Doesn't it ever worry you—having that obsession?"

"No," said Chavez. Bridgewell slowed slightly as the road became city street angling past blocks of crumbling budget housing. "Turn left on Rosa. Head downtown."

"Where are we eating? I'm hungry enough to eat coal byproducts."

"Close. We're going to the 'oil can.'"

"Huh?" Bridgewell said again.

"The Petroleum Tower. Over there." Chavez pointed at a forty-storey cylindrical pile. It was windowed completely with bronze reflective panes. "The rooftop restaurant's rather good."

They left Scarlett in an underground lot and took the high-speed exterior elevator to the top of the Petroleum Tower. Bridgewell closed her eyes as the ground level rushed away from them. At the fortieth floor

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

she opened her eyes to stare at the glassed-in restaurant, the lush hanging plants, the noontime crowd. "Who *are* these people? They all look so, uh, professional."

"They are that," said Chavez, leading the way to the maître d'. "Oil people. Uranium people. Coal people. Slurry people. Shale people. Coal gasification—"

"I've got the point," Bridgewell said. "I feel a little underdressed."

"They know me."

And so, apparently, they did. The maître d' issued orders and Bridgewell and Chavez were instantly ushered to a table beside a floor-to-ceiling window.

"Is this a perk of being maybe the world's greatest molecular biologist?"

Chavez shook his head. "More a condition of originally being a local boy. Even with the energy companies, this is still a small town at heart." He fell silent and looked out the window. The horizon was much closer than he remembered from his childhood. A skiff of brown haze lay over the city. There was little open land to be seen.

They ordered drinks.

They made small-talk.

They ordered food.

"This is very pleasant," said Bridgewell, "but I'm still a correspondent. I think you're sitting on the biggest story of the decade."

"That extraterrestrial ambassadors are shortly to land near Albuquerque? That they have picked America as a waystation to repair their ship?"

Bridgewell looked bemused. "I'm realizing I don't know when you're kidding."

"Am I now?"

"Yes."

"So why do you persist in questioning me?"

She hesitated. "Because I suspect you want to tell someone. It might as well be me."

He thought about that a while. The waiter brought the garnish tray and Chavez chewed on a stick of carrot. "Why don't you tell me the pieces you've picked up."

"And then?"

"We'll see," he said. "I can't promise anything."

Bridgewell said. "You're a lot like my father. I never knew when he was kidding either.

"Your turn." said Chavez.

The soup arrived. Bridgewell sipped a spoonful of French onion and set the utensil down. "The New Mexico Project. It doesn't seem to have anything to do with New Mexico. You wouldn't believe the time I've spent on the phone. All my vacation I ran around that state in Scarlett."

Chavez smiled a long time, finally said, "Think metaphorically. The Manhattan Project was conducted under Stag Field in Chicago."

"I don't think the New Mexico Project has anything to do with nuclear energy," she said. "But I have heard a lot of mumbling about DNA chimeras."

"So far as I know, no genetic engineer is using recombinant DNA to

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

hybridize creatures with all the more loathsome aspects of snakes, goats, and lions. The state of the art improves, but we're not that good yet."

"But I shouldn't rule out DNA engineering?" she said.

"Keep going."

"Portuguese is the official language of Brazil."

Chavez nodded.

"UBC's stringer in Recife has it that, for quite a while now, nothing's been coming out of the Brazilian nuclear power complex at Xique-Xique. I mean there's *news,* but it's all through official release. Nobody's going in or out."

Chavez said, "You would expect a station that new and large to be a concern of national security. Shaking down's a long and complex process."

"Maybe." She picked the ripe olives out of the newly arrived salad and carefully placed them in a line on the plate. "I've got a cousin in movie distribution. Just real scutwork so far, but she knows what's going on in the industry. She told me that the U.S. Department of Agriculture ordered a print from Warner Bros. dubbed in Portuguese and had it shipped to Brazilia. The print was that movie you're apparently so concerned with—*Them!* The one about the ants mutating from radioactivity in the New Mexico desert. The one about giant ants on the rampage."

"Only a paranoid could love this chain of logic," said Chavez.

Her face looked very serious. "If it takes a paranoid to come up with this story and verify it," she said, "then that's what I am. Maybe nobody is willing to make the jumps. I am. I know nobody else has the facts. I'm going to get them."

To Chavez, it seemed that the table had widened. He looked across the linen wasteland at her. "The formidable Formicidae family..." he said. "So have you got a conclusion to state?" He felt the touch of tiny legs on his leg. He felt feathery antennae tickle the hairs on his thigh. He jerked back from the table and his water goblet overturned, the waterstain spreading smoothly toward the woman.

"What's wrong?" said Bridgewell. He heard concern in her voice. He slapped at his leg, stopped the motion, drew a deep breath.

"Nothing." Chavez hitched his chair closer to the table again. A waiter hovered at his shoulder, mopping the water with a towel and refilling the goblet. "Your conclusion." His voice strengthened. "I asked about your theory."

"I know this sounds crazy," said Bridgewell. "I've read about how the Argentine fire ants got to Mobile, Alabama. And I damned well know about the bees—I told you that."

Chavez felt the touch again, this time on his ankle. He tried unobtrusively to scratch and felt nothing. Just the touch. Just the tickling, chitinous touch.

"Okay," Bridgewell continued. "All I can conclude is that somebody in South America's created some

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

giant, mutant ants, and now they're marching north. Like the fire ants. Like the bees."

"Excuse me a moment," said Chavez, standing.

"Your face is white," said Bridgewell. "Can I help you?"

"No." Chavez turned and, forcing himself not to run, walked to the restroom. In a stall, he lowered his trousers. As he had suspected, there was no creature on his leg. He sat on the toilet and scratched his skinny legs until the skin reddened and he felt the pain. "Damn it," he said to himself. "Stop." He took a pill from the case and downed it with water from the row of faucets. Then he stared at himself in the mirror and returned to the table.

"You okay?" Bridgewell had not touched her food.

He nodded. "I'm prey to any number of ailments; goes with the territory. I'm sorry to disturb your lunch."

"I'm apparently disturbing yours more."

"I offered." He picked up knife and fork and began cutting a slice of cold roast beef. "I offered—so follow this through. Please."

Her voice softened. "I have the feeling this all ties together somehow with your wife."

Chavez chewed the beef, swallowed without tasting it. "Did you look at the window?" Bridgewell looked blank. "The stained glass in the library."

Her expression became mobile.

This Publication is Available in MICROFORM

. . . from

Xerox University Microfilms

300 North Zeeb Rd.,
Ann Arbor, Mich. 48106
(313) 761-4700

PLEASE WRITE
FOR COMPLETE
INFORMATION

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

"The spiral design? The double helix? I loved it. The colors are incredible."

"It's exquisite and it's my past." He took a long breath. "Annie gave it to me for my forty-first birthday. As well, it was our first anniversary. Additionally it was on the occasion of the award. It meant more to me than the trip to Stockholm." He looked at her sharply. "You said you did your homework. How much *do* you know?"

"I know that you married late," said Bridgewell, "for your times."

"Forty."

"I know that your wife died of a freak accident two years later. I didn't follow-up."

"You should have," said Chavez. "Annie and I had gone on a picnic in the Florida panhandle. We were driving from Memphis to Tampa. I was cleaning some catfish. Annie wandered off, cataloguing insects and plants. She was an amateur taxonomist. For whatever reason—God only knows—I don't—she disturbed a mound of fire ants. They swarmed over her. I heard her screaming. I ran to her and dragged her away and brushed off the ants. Neither of us had known about her protein allergy—she'd just been lucky enough never to have been bitten or stung." He hesitated and shook his head. "I got her to Pensacola. Annie died in-anaphylactic shock. The passages swelled, closed off. She suffocated in the car."

Bridgewell looked stricken. She started to say, "I'm sorry, Dr. Chavez. I had no—"

He held up his hand gently. "Annie was eight months pregnant. In the hospital they tried to save our daughter. It didn't work." He shook his head again, as if clearing it. "You and Annie look a bit alike—coltish, I think is the word. I expect Patricia would have looked the same."

The table narrowed. Bridgewell put her hand across the distance and touched his fingers. "You never remarried."

"I disengaged myself from most sectors of life." His voice was dispassionate.

"Why didn't you reengage?"

He realized he had turned his hand over, was allowing his fingers to curl gently around hers. The sensation was warmth. "I spent the first half of my life singlemindedly pursuing certain goals. It took an enormous investment of myself to open my life to Annie." As he had earlier in the morning when he'd first met Bridgewell, he felt profoundly weary. "I suppose I decided to take the easier course; to hold onto the past and call it good."

She squeezed his hand. "I won't ask if it's been worth it."

"What about you?" he said. "You seem to be in ferocious pursuit of your goals. Do you have a rest of your life hidden off to the side?"

Bridgewell hesitated. "No. Not yet. I've kept my life directed, very concentrated, since—everyone died. But someday..." Her voice trailed off. "I still have time."

"Time," Chavez said, recognizing

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

the sardonicism. "Don't count on it."

Her voice very serious, she said, "Whatever happens, I won't let the past dictate to me."

He felt her fingers tighten. "Never lecture someone three times your age," he said. "It's tough to be convincing." He laughed and banished the tension.

"This *is* supposed to be an interview," she said, but didn't take her hand away.

"Did you ever have an ant farm as a child?" Chavez said. She shook her head. "Then we're going to go see one this afternoon." He glanced at the food still in front of her. "Done?" She nodded. "Then let's go out to the university field station."

They stood close together in the elevator. Bridgewell kept her back to the panoramic view. Chavez said, "I've given you no unequivocal statements about the New Mexico Project."

"I know."

"And if I should tell you now that there are indeed monstrous ant mutations—creatures large as horses—tramping toward us from the Mato Grosso?"

This time she grinned and shook her head silently.

"You think me mad, don't you?"

"I still don't know when you're kidding," she said.

"There are no giant ants," said Chavez. "Yet." And he refused to elaborate.

The field station of the Wyoming State University at Casper was thirty kilometers south, toward the industrial complex at Douglas-River Bend. Two kilometers off the freeway, Scarlett clattered and protested across the pot-holed access road, but delivered them safely. They crossed the final rise and descended toward the white dome and the cluster of out-buildings.

"That's huge," said Bridgewell. "Freestanding?"

"Supported by internal pressure," said Chavez. "We needed something that could be erected quickly. It was necessary that we have a thoroughly controllable internal environment. It'll be hell to protect from the snow and wind come winter, but we shouldn't need it by then."

There were two security checkpoints with uniformed guards. Armed men and women dubiously inspected the battered VW and its passengers, but waved them through when Chavez produced his identification.

"This is incredible," said Bridgewell.

"It wasn't my idea," said Chavez. "Rules."

She parked Scarlett beside a slab-sided building that adjoined the dome. Chavez guided her inside, past another checkpoint in the lobby, past obsequious underlings in lab garb who said, "Good afternoon, Dr. Chavez," and into a sterile-appearing room lined with electronic gear.

Chavez gestured at the rows of monitor screens. "We can't go into the dome today, but the entire in-

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

stallation is under surveillance through remotely controlled cameras." He began flipping switches. A dozen screens jumped to life in living color.

"It's all jungle." Bridgewell said.

"Rain forest." The cameras panned past vividly green trees, creepers, seemingly impenetrable undergrowth. "It's a reasonable duplication of the Brazilian interior. Now, listen." He touched some other switches.

At first the speakers seemed to be crackling with electronic noise. "What am I hearing?" she finally said.

"What does it sound like?"

She listened longer. "Eating?" She shivered. "It's like a thousand months eating."

"Many more," Chavez said. "But you have the idea. Now watch."

The camera eye of the set directly in front of her dollied in toward a wall of greenery wound round a tree. Chavez saw the leaves ripple, undulating smoothly as though they were the surface of an uneasy sea. He glanced at Bridgewell; she saw it too. "Is there wind in the dome?"

"No," he said.

The view moved in for a closeup. "Jesus!" said Bridgewell.

Ants. Ants covered the tree, the undergrowth, the festooned vines.

"You may have trouble with the scale," Chavez said. "They're about as big as your thumb."

The ants swarmed in efficient concert, mandibles snipping like garden shears, stripping everything green, everything alive. Chavez stared at them and felt only a little hate. Most of the emotion had long since been burned from him.

"Behold *Eciton*," said Chavez. "Driver ants, army ants, the *maripunta*, whatever label you'd like to assign."

"I've read about them," said Bridgewell. "I've seen documentaries and movies at one time or another. I never thought they'd be this frightening when they were next door."

"There is fauna in the environment too. Would you like to see a more elaborate meal?"

"I'll pass."

Chavez watched the leaves ripple and vanish, bit by bit. Then he felt the tentative touch, the scurrying of segmented legs along his limbs. He reached out and tripped a single switch; all the pictures flickered and vanished. The two of them sat staring at the opaque gray monitors.

"Those are the giant ants?" she finally said.

"I told you the truth." He shook his head. "Not yet."

"No kidding now," she said.

"The following is a deliberate breach of national security," he said. "So they tell me." He raised his hands. "So what?" Chavez motioned toward the screens. "The *maripunta* apparently are mutating into a radically different form. It's not an obvious physical change, not like in *Them!* It's not by deliberate human agency, as with the bees. It may be through ac-

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

cidental human action—the Brazilian double-X nuclear station is suspected. We just don't know. What we do understand is that certain internal regulators in the *maripunta* have gone crazy."

"And they're getting bigger?" She looked bewildered.

He shook his head violently. "Do you know the square-cube law? No? It's a simple rule of nature. If an insect's dimensions are doubled, its strength and the area of its breathing passages are increased by a factor of four. But the mass is multiplied by eight. After a certain point, and that point isn't very high, the insect can't move or breathe. It collapses under its own mass."

"No giant ants?" she said.

"Not yet. Not exactly. The defective mechanism in the *maripunta* is one which controls the feeding and foraging phases. Ordinarily the ants—all the millions of them in a group—spend about two weeks in a nomadic phase. Then they alternate three weeks in place in a statary phase. That's how it used to be. Now only the nomadic phase remains."

"So they're moving," said Bridgewell. "North?" She sat with hands on knees. Her fingers moved as though with independent life.

"The *maripunta* are ravenous, breeding insanely, and headed our way. The fear is that, like the bees, the ants won't proceed linearly. Maybe they'll leapfrog aboard a charter aircraft. Maybe on a Honduran freighter. It's inevitable."

Bridgewell clasped her hands; with effort she forced them to remain still in her lap.

Chavez continued, "Thanks to slipshod internal Brazilian practices over the last few decades, the *maripunta* are resistant to every insecticide we've tried."

"They're unstoppable?" Bridgewell said.

"That's about it," said Chavez.

"And that's why the public's been kept in the dark?"

"Only partially. The other part is that we've found an answer."

Chavez toyed with the monitor switches but stopped short of activating them. "The government agencies involved with this project fear that the public will misunderstand our solution to the problem. Don't forget that next year's an election year." Chavez smiled ruefully. "There's a precedence to politics."

Bridgewell glanced from the controls to his face. "You're part of the solution. How?"

Chavez decisively flipped a switch and they again saw the ant-ravaged tree. The limbs were perceptibly barer. He left the sound down. "You know my background. You were correct in suspecting the New Mexico Project had something to do with recombinant DNA and genetic engineering. You're a good journalist. You were essentially right all down the line." He looked away from her toward the screen. "I and my people here are creating giant ants."

Bridgewell's mouth dropped open

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

slightly. "I—but, you—"

"Let me continue. The purpose of the New Mexico Project has been to tinker with the genetic makeup of the *maripunta*—to create a virus-borne mutagen that will single out the queens. We've got that agent now."

All correspondent again, Bridgewell said, "What will it do?"

"At first we were attempting to read-just the ants' biological clocks and alter the nomadic phase. Didn't work; too sophisticated for what we can accomplish. So we settle for something more basic, more physical. We've altered the ants to make them huge."

"Like in *Them!*"

"Except that *Them!* was a metaphor. It stated a physical impossibility. Remember the square-cube law?" She nodded. "Sometime in the near future, bombers will be dropping payloads all across Brazil, Venezuela, the Guianas...anywhere we suspect the ants are. The weapon is dispersal bombs, aerosol cannisters containing the viral mutagen to trigger uncontrolled growth in each new generation of ants."

"The square-cube law..." said Bridgewell softly.

"Exactly. We've created monsters—and gravity will kill them."

"It'll work?"

"It should." Then Chavez said very quietly, "I hope I live long enough to see the repercussions."

Bridgewell said equally quietly, "I *will* file this story."

"I know that."

"Will it get you trouble?"

"Probably nothing I can't handle." Chavez shrugged. "Look around you at this multi-million dollar installation. There were many more convenient places to erect it. I demanded it be built here." His smile was only a flicker. "When you're a giant in your field—and needed—the people in power tend to indulge you."

"Thank you, Dr. Chavez," she said.

"Dr. Chavez? After all this, it's still not Paul?"

"Thanks, Paul."

They drove north, back toward Casper, and watched the western photochemical sunset. The sun sank through the clouds in a splendor of reds. They talked very little. Chavez found the silence comfortable.

Why didn't you reengage?

The question no longer disturbed him. He hadn't truly addressed it. Yet it was no longer swept under the carpet. That made all the difference.

I'll get to it, he thought. Chavez stared into the windshield sun-glare and saw his life bound up in a leaded pane like an ambered insect.

Bridgewell kept glancing at him silently as she drove up the long mountain road to Chavez's house. She passed the stand of pine where she had hidden Scarlett earlier in the day and braked to a stop in front of the stone house. They each sat still for the moment.

"You'll want to be filing your story," said Chavez.

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

She nodded at him silently.

"Now that you know the way up my tree, perhaps you'll return to visit in a more conventional way?"

Bridgewell smiled. She leaned across the seat and kissed him on the lips. It was, Chavez thought, a more than filial kiss. "Now *I'm* not kidding," she said.

Chavez got out of the Volkswagen and stood on the flagstone walk while Bridgewell backed Scarlett into the drive and turned around. As she started down the mountain, she turned and waved. Chavez waved. He stood there and watched until the car vanished around the first turn.

He walked back to the house and found O'Hanlon waiting, arms folded against the twilight chill, on the stone step. For a moment Chavez hesitated beside her and they both looked down the drive and beyond. Casper's lights began to blossom into a growing constellation.

"Does she remind you considerably of what Patricia might have been like?" said O'Hanlon.

Chavez nodded, and then said quickly. "Don't go for easy Freud. There's more to it than that—or there may be."

A slight smile tugged at O'Hanlon's lips. "Did I say anything?"

"Well, no." Chavez stared down at the city. He said, with an attempt at great dignity, "We simply found, in a short time, that we liked each other very much."

"I thought that might be it." O'Hanlon smiled a genuine smile. "Shall we go inside? Much longer out here and we'll be ice. I'll fix some chocolate."

He reached for the door. "With brandy?"

"All right."

"And you'll join me?"

"You know I ordinarily abstain, Dr. Chavez, but—" Her smile impossibly continued. "It is rather a special day, isn't it?" She preceded him through the warm doorway.

Chavez followed with a final look at the city. Below the mountain, Casper's constellation winked and bloomed into the zodiac.

Twelve hours later, the copyrighted story by Laynie Bridgewell made the national news and the wire services.

Eighteen hours later, her story was denied by at least five governmental agencies of two sovereign nations.

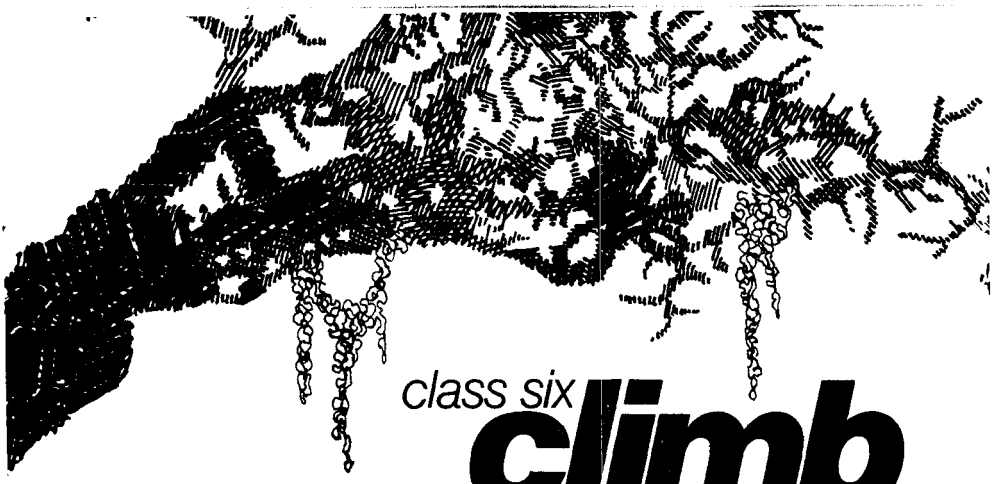
Twelve days later, Paul Chavez died quietly in his sleep, napping in the library.

Twenty-two days later, squadrons of jet bombers dropped cargoes of hissing aerosol bombs over a third of the South American continent. The world was saved. For a while, anyway. The grotesquely enlarged bodies of *Eciton burchelli* would shortly litter the laterite tropical soil

Twenty-seven days later, at night, an intruder climbed up to the balcony of Paul Chavez's house on Casper Mountain and smashed the stained glass in the French doors leading into the library. No item was stolen. Only the window was destroyed. ■

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED



class six climb

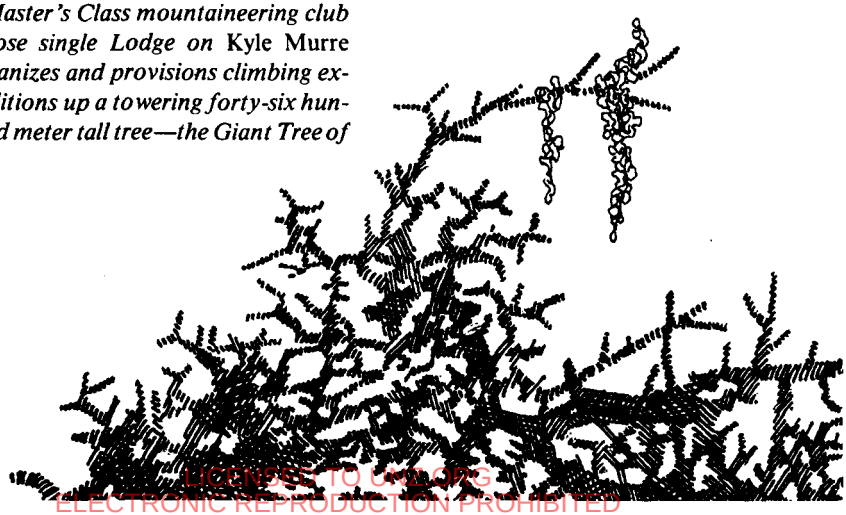
Mountain or Tree, the object of the climb remains the master. Those who climb must meet it on its own terms—or die.

by William E. Cochrane

PART THREE OF THREE PARTS

SYNOPSIS:

The planet Kyle Murre *is a carefully protected primitive planet. Protected for the welfare of its native population and the preservation of a species of long-lived, very large trees. This protection is maintained partly by Naval surveillance but mostly by means of an exclusive recreation club, the Taansvaal Sporting Club. The TSC is a Master's Class mountaineering club whose single Lodge on* Kyle Murre *organizes and provisions climbing expeditions up a towering forty-six hundred meter tall tree—the Giant Tree of*



LICENSED TO UNKNOWN
ELECTRONIC REPRODUCTION PROHIBITED

Kyle Murre.

Admiral Gregarson, Chief of Space Operations, learns of plans to create a political incident on Kyle Murre *in order to break the TSC's exclusive charter and open the planet. As part of a counter operation, the Admiral plans to send a covert team of Master's Class mountaineers to* Kyle Murre *in order to have someone available if climbing skills are needed. These recruits must have the required climbing background and records—civilian mountaineers, rather than Mountain Marines, who would be most likely to be invited to come to* Kyle Murre *for only one serious purpose; to attempt mountaineering's most unique climb, the living Tree of* Kyle Murre.

"Doc" Elden Barr is an anthropologist who combines mountaineering with his career and has to be recruited by a Colonel of the Mountain Marines who arranges an interview at the cliff-dwellings on Doc's near-inaccessable dig-site. Doc Barr is as impresed by the method used to recruit him as he is by the reasons the Colonel states to explain why Doc is needed on Kyle Murre. *Doc is told about Brigade Captain FitzRoi, who has been sent to* Kyle Murre *to provoke riots, and about another Master's Class mountaineer, Jessica Van Horn. Jessica Van Horn is a wealthy industrial administrator who has been invited to* Kyle Murre *to climb. Doc Barr is asked to be one of a civilian climb party that will go to the TSC Lodge and insure that no accidents happen to Jessica Van Horn on the climb. FitzRoi could use such an accident to provoke his riot and the incident. Since Doc Barr is a Master's Class climber and can fully appreciate the chance to make* Kyle Murre's *unique record climb, he accepts the job.*

The Colonel of the Mountain Marines, with some deviousness, next recruits Jessica Van Horn for the climb party by posing as an agent of the Taansvaal Sporting Club and delivering her a gift invitation to come and climb the Tree. Jessica, also a Master's Class mountaineer, finds the once-in-a-lifetime climb at Kyle Murre *irresistable and accepts the invitation.*

The third member of the party, Arden Barth, is a professional guide, somewhat down on his luck. He is given his invitation to Kyle Murre *by a female client after he takes her on her first initiation climb to a mountain top.*

The three climbers, Barr, Van Horn, and Barth arrive at Kyle Murre *and find that they must face a two day acclimatization period before the TSC will let them do any climbing. Also the fourth member of the climb party, Captain FitzRoi, who arrived a day earlier, is already making himself obnoxious to the staff and the native guides of the TSC Lodge. Captain FitzRoi has made it clear to everybody around him that he came to* Kyle Murre *to climb the Giant Tree alone—solo. He resents being included in a party.*

The solo climb is against TSC policy

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

and against the quasi-religious custom of the native guides who endow the Giant Tree with great powers. Captain FitzRoi is not using this solo climb as the "incident," required by his Admiral. This is something personal concerning his mountaineering skills and reputation and the ranking of the giant Tree as the ultimate, unique, climbing experience. FitzRoi wants to climb solo and attempts to disrupt a planning session, but is stopped by the Director of the TSC Lodge, John Bryant, who also tells FitzRoi that he can't climb solo. Then, almost as an apology, Bryant also tells FitzRoi that he also can't leave Kyle Murre. *There has been a space accident, out-orbit. The Space Marines are tracing the radioactives, but* Kyle Murre's *spaceport is not accepting any traffic. Thus Director Bryant, indirectly tells FitzRoi that the support he expected may not be coming.*

But FitzRoi misses the message in his anger at not being allowed to climb. He is concerned with planning a way to achieve that solo climb as he takes a rollogon-truck and goes into the forest to get away from the TSC Lodge. There, in a forest grove, he comes upon a small tree which is guarded and protected as a Sacred Tree by Kyle Murrian Tree Guardians. FitzRoi, still angry at the TSC and all things Kyle Murrian, drives his rollogon straight at the native Guardians and the grove tree. The Guardians fire on him with crossbows and drive him off.

One of the Guardians is J'Gween, the Kyle Murrian climb guide who has been contracted to take Barr, Van Horn, Barth, and FitzRoi up the Giant Tree. Using signal drums, J'Gween warns his fellow Guardians about the threat to the Grove Tree and the identity of Captain FitzRoi as one of the climbers. Since FitzRoi is a climber, the Guardians will do nothing about his damage at the grove. They will leave that to the power of the Giant Tree.

J'Gween goes to the Lodge to meet with Doc Barr, Jessica Van Horn, and Arden Barth and to show them a first morning view of the Giant Tree that they are going to climb. Because of the fogs this is the first sight they have had of the Tree and they are profoundly impressed. For the first time they see the true size of the living Tree at its base and the climb routes up the rough crevasses and folds of bark, routes which they must follow when they begin the climb tomorrow. This is the Giant Tree of Kyle Murre... *tomorrow... They will all climb that...*

FitzRoi returns to his room in the Lodge still fighting his anger at the way he was attacked in the Grove. His mission is to provoke incidents on this planet, but he has been off balance since he arrived, unable to control events, and now the natives have kicked him out of their forest grove. As he vents his anger on the furniture, he realizes that the Kyle Murrians may have shown him a way to start getting what he wants. He begins plotting instantly and gives his aid, Corporal Anderson, orders to unpack the

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

special sabotage equipment that they have smuggled in. Some of FitzRoi's climbing equipment is quite lethal.

FitzRoi and Anderson attack the Sacred Grove, and kill the Guardians. This comes as a surprise to Anderson who didn't know the narcotic darts were lethal. He begins to be very careful around FitzRoi.

FitzRoi plants explosive charges around the Grove Tree and rigs a detonator to a remote trigger. He shows this to a climb guide, H'Reeh, whom he has kidnapped from the Lodge, and threatens to destroy the Grove Tree unless H'Reeh will guide him in a solo climb up the Giant Tree. H'Reeh agrees to do so.

Elden Barr, Jessica Van Horn, and Arden Barth have had their climbing gear delivered to their rooms. They have completed their period of acclimatization and will start their climb the next morning. Most of the night is spent, by each of them, in checking equipment and in emotional preparations. In the morning they come down to the lobby of the Lodge to find the TSC building virtually under seige. The natives are blocking the doorways and the air is filled with sounds of drumming. The Lodge staff have all taken on the aspect of a military command and all thought of a peaceful climb is gone.

The three climbers find out what FitzRoi has done. He has mined the Grove Tree and, with the kidnapped guide, started up the Giant Tree, climbing solo. He has the remote trigger detonator with him and he is endangering the whole Lodge operation as well as the Grove Tree. The spacesport operations are at a standstill also as every native on the coast seems to be headed for the Giant Tree to be present if FitzRoi destroys the Grove Tree.

Barr, Van Horn, and Barth are asked to go after FitzRoi and try to stop him before he can detonate the explosives. The natives are passively waiting for the power of the Tree to destroy FitzRoi and there are no Mountain Marines or Kyle Murrian Native Police close enough to help. They, the three climbers, are the only mountaineers who can climb the Tree as well as FitzRoi.

They agree to follow him and do what they can. The climb party will be guided by J'Gween, the Grove Guardian who was to have guided the original party. They go out to the base of the Giant Tree to begin the climb.

At the base of the Tree, as they assemble their equipment, they meet a TSC staff man coming back from his inspection of the explosives at the Grove and find the body of Corporal Anderson. FitzRoi has killed his aide and is on the tree; climbing solo.

Arden Barth starts off by assuming the leadership of the climb party and rushing everybody. At first this doesn't matter too much as they are climbing on well marked training pitches, but as the climb gets more difficult the pace he is setting becomes hard to follow.

J'Gween is worried at the way Barth is climbing. He is out of rhythm with

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

the Tree and not climbing with regard for the other two people. On the Tree this sort of work is dangerous. J'Gween helps Jessica and Doc, advising them how to climb in harmony with the Tree. But despite the guide's efforts, the climb party stretches out as far as their ropes will let them. In the folds and crevasses of the tree-bark they are often out of sight of one another.

J'Gween finally forces a halt at the Cave of Winds. The party must take a rest stop here because the climbing beyond this point is harder and also because of damage on the way ahead. J'Gween needs to change the route.

Arden becomes angry over the halt and the route change. Accusing J'Gween of deliberately slowing their pursuit of FitzRoi in order to protect the Grove Tree, Arden Barth arrogantly forces the climb party to cut short the stop and follow him as he goes on up the Tree. He climbs rapidly and carelessly and finally falls.

Jessica Van Horn catches his fall with the rope and J'Gween comes to help him get back to safety. Then J'Gween stops again to inspect the rope and to put Doc Barr in the lead spot and force Arden to climb in last position. Arden objects seriously to this and refuses to give up his lead position. J'Gween has to threaten to cancel the climb and go back down, before Barth angrily trades places with Doc and lets him lead.

The order of climbing has been changed, but little else, and everybody knows it. Doc still has to climb out to negotiate the spot where Arden fell. Jessica must brace herself again to hold Doc if he falls. Arden is still angry at them all. Nothing has changed.

J'Gween uses his drumsticks to draw strength and confidence from the drumbeating of his fellow Guardians below and signals Doc Barr to begin climbing.

Doc climbs out of sight, the rope

This publication is indexed in

The MAGAZINE INDEX®

. . . available online via

Lockheed's Dialog Service

and in COM microform

For information write to

INFORMATION ACCESS CORPORATION
885 North San Antonio Road
Los Altos, Ca. 94022
(415) 941-1100
800-227-8431

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

tightens, and Jessica follows him as Arden impatiently waits. The party is climbing again; the Kyle Murrian drums following them.

12

The sun had moved onward into the noon position, overhead and a little behind the climb party in the northern sky and the dim shadows that the climbers cast were short, almost invisible. More important, the shadow patterns that revealed the cracks and footholds were reduced and Doc was finding it hard to pick out a route for more than two or three holds ahead. He was forced to follow J'Gween's lead almost exactly. The guide was staying close, moving just ahead of Doc, climbing on, or near holds that the climbers could use; ledges to fit their boots, places for firm hand holds. Doc used these climb points and knew that Jessica and Arden below him would mark them and use them too. Climbing as a team, and supported and guarded by the half-heard drumbeats from the ground far below, the trio climbed up...and up.

Doc climbed evenly, his mind fully committed to the problems of hand-hold and foothold, his body concentrated on balance and the even strain-tensions of the climb. He'd spent a little time, as he began to lead the climb, in worrying about where FitzRoi was and when they might catch up to him. He had a couple of wild wishes—visions of Colonel Estaban and her Mountain Marines. Wishing that he was climbing with a combat team, armed and ready and rough. Then he forgot the worry and the wishing as he gave himself over to the business of the climb.

Climbing for Doc was a near perfect thing in itself and he met it always with an inner balance of emotion that he'd learned long ago. Indeed, this inner quiet, the washing away of every other concern in the universe save the balance of the climb, the next step, the next rise to a hold, was the main reason Doc kept coming back to the mountains—or, this time, to the *Kyle Murre* Tree.

He worked at a job—studying primitive races, or the remains of primitive races—in a technologically oriented science that forced him to use electronics, computers and highly mechanized micro-diggers if he didn't want to have his work discounted as incomplete. The constant conflict between the basic tool-users who had built the ruins he researched and the profusion of modern gadgetry in his digging camps always drove him back to the mountains. There, in high-rock climbing, the mechanics of a space-traveling civilization were discounted. Through desire of conservation of beauty and sporting skill, rock climbers had limited themselves to standardized tools that were as primitive as anything Doc dug out of his search-sites, rope, nut-loops, leather shoe-boots, un-heated clothes, and man against a mountain. Rock climbing was ultimate romanticism in a civilization built on machines, but it was mind saving—soul saving. Life had a simplicity in places like Tell

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

Alph...and *Kyle Murre's* unique giant Tree. In these places he could, as now, lay face and chest and straining arms against a solid, unchanging climb-face and look outward at a horizon of nothing. The sky and cloud and forest far below were insignificant, literally meaningless compared to the pressure of his feet against the Tree-bark and the stinging pain/strength of his fingers supporting his balance. His mind, too was wonderfully concentrated on nothing in all the universe beyond the sphere of his climbing, concentrated on the task of extending his arm and hand toward the act of forcing a cold metal nut into a perfectly formed crack for his next point of support. He focused all his being on the climb, nothing else.

Moving steadily up the vertical bark-side of the *Kyle Murre* Tree, three thousand meters above the ground, Doc was at peace, balanced inwardly, as well as outwardly. He was having fun.

13

Doc Barr reached another good place to anchor a belay and set in his fourth nut-loop, tested it and clipped his safety line to it. Then he reached out to his right, in the direction he had been climbing, and set a second loop. The second safety line went to that anchor point, it would be behind him when he turned his back on the late afternoon sun-glow and set himself to help Jessica climb.

Before he started to change his position, his eye was caught by a patch of yellow-green on the face of the Tree, ahead of him and above. It was a patch of spongy, fiberous moss-like growth bulging from a chip-split in the bark. He saw another...then more. Ahead of him, above and beyond to the next ridge depression, were ten to twenty, maybe fifty, of these mass-clumps growing wherever he looked.

Worse—his eye tried to plan the next pitch, measuring handholds, looking for ledge-steps for his boots, trying to visualize the route he would take to climb beyond this point—the moss seemed to be growing in every desirable foot and fingerhold.

"J'Gween!" he called. "Come forward. I need you." Then he turned to the job of belaying Jessica's climb, signaling her to come on up to him.

The guide arrived at almost the same time as Jessica. He had been back along the climb rope, checking the way Arden was climbing after his fall and had come quickly, climbing above the party on the rope, as was his habit.

"What's the matter, Doc?" Jessica asked, as soon as she was clipped into one of his climb-loops.

"That out there: those green things." Doc pointed to show her and J'Gween at the same time.

"Moss?" Jessica asked, looking where he pointed.

"Looks like," Doc said. "There doesn't seem to be a way through them, J'Gween. Have we climbed around to the wrong part of the Tree. What do you call it—Damp-side?"

"No, not that. I would not guide you unsafely, Tsa. What you see is a

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

place I have been expecting. I did not think we would reach it just at this time or I would have been here to show it to you. During this time of the year the *telga* is usually higher.

"We are climbing up near the cloud regions. Here the *telga-lichen* grows and you must be careful of your holds. What you see is a plant, like the Tree, *telga-lichen,* and is dry and stiff to the touch. It is safe to touch or step on. Even good to eat, though not for Off-worlders.

"But look, just beyond. See the dark color—deeper green?"

"Ahh . . . Yes. That isn't safe, I take it?"

"No, Tsa. That is *velchen,* an animal-life that imitates the lichen in shape and color. Watch!"

J'Gween stepped out onto two holds and used a carabiner clip to press against the dark green growth. It squished and slid, liquidly, to drip over the bark surface.

"The *velchen* has a stinging acid against your hands. Your boots will protect your feet, but the wet slime when it crushes . . . that is unsafe, in that your foot would slip. You must be wary as you climb. The *telga* is safe; the *velchen* is not."

"Uh huh." Barr nodded in understanding. "I can step on the light green, but avoid the dark green."

"It is best to avoid both types. Find another hold, another way to climb, rather than step on any patches of *lichen.* It is the way-of-the-Tree, Tsa."

"All right. I'll avoid them."

"You also, Mentsa."

"Of course." She shivered a little. "I wouldn't dream of stepping on anything that goes squish."

"I will stay here until I can warn Tsa Barth, then I will come up to you," the guide said. "You may climb on, Tsa Barr, but may I suggest that you make your climbs shorter. Shorten the length of rope between you, so that the Mentsa may more easily see where you place your hands and feet."

"Very well. Any particular way you want me to climb, *Ti j?*" Doc got ready to move away from the anchor point.

"Taach! It would be wisdom to make your way toward that out-swelling up there." He pointed. "Just beyond it is a slanting chimney that we can follow with profit. I will come up to you before you get there."

Barr nodded, placed his hands, and stepped up to the climb with Jessica feeding the rope around her shoulders, as she braced herself to protect him. He climbed up to the bulge in two short stages, grinning a little to himself as he thought about Barth's reaction to this further slowdown. His route was not straight forward. The pitch was heavily populated with clumps of the lichen and their protein imitators, the *velchen.* He avoided them easily in most cases, but his climb-path was full of ups and downs.

True to his timing, J'Gween caught up just as Jessica met Barr at the projection.

"You may move around to the

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

chimney, Tsa Barr," he said, speaking easily as if he had never left them and was just continuing a conversation. "There is room in there for all the party. The Mentsa can guard Tsa Barth without help as he climbs this section. It is not difficult."

Jessica nodded and took up the tension in Barth's rope. Barr followed J'Gween around to look at the chimney.

The chimney started with a wide ledge and a pocketlike cave. At the back of the cave the chimney slanted up at an easy forty-five degrees. It wasn't tall enough to stand up in, but the slant was gentle enough to let them climb one side without using any chimney climbing techniques, and it was deep enough so that there would be no worry about falling out, even if somebody slipped.

"Like walking up stairs," Doc said. "Arden Barth will be very disappointed. Nothing to fight."

"There will be difficulties," J'Gween said, appreciating the comment about Barth's climbing. "...Near the end." He pointed upward.

Jessica moved into the cave and promptly sat down. "Ahh," she sighed. "I didn't figure on having to stand up all the way. That's one thing about rock climbing, *Ti j* J'Gween. There's always a soft rock to sit on."

"The next stretch looks easy," Doc said. "Class Four, no sweat."

"Don't remind me," Jessica groaned. "I keep remembering that hot shower back at the Lodge."

Arden came into the cave, looked up at the chimney, assessing the route with a few glances, and found a place to sit down in his turn. He began coiling his rope.

"Will you redistribute the climb-loops, Tsa Barth," J'Gween said, before Arden could begin the tirade that was in his stormy look. "We will shorten the ropes here and climb this next stretch at six-meter intervals. It is a time for resting, should you wish it, Tsarias."

"More of your widsom?" Arden asked, unhooking his supply rope and dumping the nuts at Doc's feet. "I am ready to climb now. I have been getting sufficient rest waiting for Doctor Barr to make his way up the pitches. He has been most kind."

The irony in his voice brought Barr's head up. Then, realizing the deliberate intention in Arden's words, Doc controlled himself and reached out to pick up a handful of climb-loops and pass them to Jessica.

"Please shorten your ropes, Tsarias," J'Gween repeated calmly. Arden Barth's combativeness would be absorbed by the Tree in its own time. The Tree had its own strength, needed no help from J'Gween . "Tsa Barr, should it please you, you may begin climbing when you are ready."

"Everybody secure, people?" Barr said, asking the group generally, but looking at J'Gween. The guide had been watching the rope tying operation closely, he would tell Doc if the group was ready to climb.

J'Gween nodded. A brief rest be-

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

tween these long climbs was a good thing, but too long a rest . . . Tsa Barth had said the right thing there. It was an unsafe thing for them to stop too long on the Tree-side. J'Gween's nod was a sign to send Tsa Barr up the chimney.

Jessica groaned and said, "Give me a tug on the rope, Doc. This pack's stuck . . . or I am."

"Up you come," he said, laughing as he steadied her with the rope. "Watch your head. The ceiling's low." Doc saw her find the holds and start to climb, then he turned back to continue his own ascent.

Up. Up. Step with the foot. Move the hands. Step up. The chimney climb went on. Deprived of the stimulation of searching out the path ahead, looking for the best hold, or hunting for places to set his protection loops, Doc was finding this part of the climb monotonous—and tiring. The day's climb was beginning to build fatigue poisons in his system. His eyes were blurring. The pitch ahead was . . .

No! His worries faded away, and his fatigue with them, as he realized that the chimney was filling with fog. Fog! He'd climbed up into the cloud layer.

The sunlight dimmed, darkened the walls of the chimney. Doc's left hand rubbed across a rope on the inside wall. He grinned up into the mist. J'Gween had laid down a guide rope to keep him from climbing over the edge in the cloud. Gratefully, he slid a carabiner clip, on the end of his anchor line, onto the guide rope and pushed it along as he climbed. A cautious old fuzz-tail was that *Ti j.*

"Where's all the fog come from?" Jessica asked, her voice echoing from the mist-filled chimney.

"Clouds," Doc called back. "Stay close to the back wall. There's a guide rope. Clip on and don't get lost. Feels like you might get that shower that you were thinking about, Jessica." Doc's voice drifted back, tinged with laughter. "Not very hot, though, more luke-warm."

"Feels good," Jessica said.

The mist did feel good, seemed to add to Doc's strength. Being in the cloud cut the green-house heat of *Kyle Murre* . . . not much, but enough to be refreshing. The warm wetness made the climbing easier, even though he could only see a few meters ahead. The height of the Tree disappeared as he lost sight of the forest tops on the horizon below. The vertical wall effect of the climb was lost as he climbed in the cotton-wool mist.

The floor of the chimney widened and leveled out. Doc found he could stand up, J'Gween had clipped the guide rope about waist high. Doc was walking on a ledge about two meters wide. He walked carefully. He had a feeling that the chimney was about to come to an end.

And it did. He stopped short.

Ahead of him was a massive overhanging block. It stretched up as far as he could see into the fog and out to his right, away from the Tree, also disappearing in the mist. Up, down and out; his way was blocked. The

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

chimney had come to an end.

"What's wrong?" Jessica asked. With the shortened rope lengths she had climbed up behind him quickly.

"A big overhang. It blocks the chimney and it's unclimbable," Doc said.

"Trouble?" Arden's query came up from the depths of the fog-filled chimney.

"It doesn't go, Arden," Jessica called down. "Hold one! Doc's checking. Where's J'Gween?" she asked, turning back to Barr.

"I don't know. Maybe he can climb upside down." Doc lifted one of the hex-nuts off his supply rope and dangled it contemplatively. "These loops are working fine for what we've met so far—bomb-proof on this vertical stuff. But I've never done an overhang with them, and I'm not going to start on this one. Can you see? Two meters out, in any direction and I'd be flat upside down. And as for down . . . that's just as bad. Nobody climbs down an overhang." He let the nut-loop fall back against his side in disgust.

"J'Gween didn't bring any ladders or entriers, and he said no pitons or bolts," Jessica said. "That must mean he has another route around this block, doesn't it? If we absolutely had to climb this . . . he'd have brought the gear, Doc. You know that he's a very careful guide."

"Well, where is that careful guide?" Doc said. He was totally dependent on the fact that J'Gween knew of a route out of this dead end. The only alternative was to back down the chimney and try another way from the bottom.

"Here, Tsa Barr," J'Gween's voice came from the left and above, echoing strangely in the fog. "I have been checking the way above and I have found it clear. Come up through here."

Here, was a wide-ish crack in the roof of the chimney and the end of J'Gween's rope dropped through to mark it. "You will be able to pull yourself up easily and there is room to stand. And a way to climb."

Doc put his hands to the hole and stood up in it. His pack cleared the sides handily and his head was above the opening onto the ledge. He could see J'Gween standing, waiting for him, his tail ticking back and forth in an even rhythm. Doc lifted his arms, positioned his hands, found a foothold and levered himself up out of the chimney. The guide was right, it took very little effort.

He stood, turned back to the hole and took up the rope slack so as to aid Jessica. Her voice murmured briefly, she was telling Arden the route, then her head appeared and she said, "Boo!" and grinned. She found her holds, tightened her muscles and lifted herself out of the chimney.

Doc grinned back at her and left her to handle Arden's rope.

"What's next, *Ti j?*" he asked. moving over beside the guide. "I'm glad to see you. I thought that overhang back there had us stopped."

"The overhand is behind you, Tsa Barth. It is the first of the Tree's

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

branches. We have reached that level."

"A branch!" Doc turned to look at the blocking massif and whistled. "It's bigger than a house. No wonder I couldn't see the end of it."

"We climb around it," J'Gween said bringing Doc back to business. "Along this crack." He indicated a double lipped groove, angling up into the cloud. It was a smaller edition of the chimney they'd just climbed, only a meter wide—less, in some places that he could see before the outline was lost in the fog.

"You will have to climb with your feet here . . . and tension with your hands here . . ." J'Gween said.

"Layback," Doc nodded solemnly. "How far, *Tij?* The party is beginning to tire."

"It is not far, Tsa Barr." J'Gween reached out and began to untie the climb-rope. "I will make a further change in the leaders place to take away the fatigue." He took the rope over to Jessica. "Will you climb as leader, Mentsa?" he asked, ignoring Arden who was sitting on the lip of the hole. "This first part is not far, some twenty meters like this, then it levels and you may handle it like a ledge. At fifty meters there is a broken place where a belay is possible. I have set the anchor loops there. You will find them."

"You shouldn't have trouble with that," Doc said. "But you'll need more than six meters of rope. Hold one!" He was pulling off the extra loops of rope slung over his shoulder, feeding them to J'Gween for retying to her harness.

"Slip me your loops, Arden. I'll climb last for a while." Arden ignored him, seeming not to hear, and so apparently did J'Gween, for he proceeded to link Doc up in the second position.

"And you must place your hands where the edges are small and not rounded, Mentsa," J'Gween said, knotting the ropes deftly as he talked to the woman. "There will be no trouble with the footholds, but on this side the bark-edge sometimes becomes too thick to grab properly. Some skill must be used."

"I understand. Ready, Doc?" Jessica didn't comment on the change of position on the climb-rope. She was too concerned with the pitch ahead.

"Set!" Doc took up a belay position with the rope over his shoulders. J'Gween, without comment, placed an anchor loop in the floor of the bench and hooked in a second safety line for Doc's harness.

Jessica set her body in the layback position at the crack. He feet were on lip, her body bent at the waist, hands gripping the other lip and pulling against the tension of her legs. She began to walk up the crevice, her body and legs parallel to the ground as though she were sitting on air. She climbed using handholds for balance and working up the crack much as she would have used a rope to climb a vertical wall. Her movements were sure and confident and the clouds wrapped around her and took her out of sight in

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

no more than twenty steps.

Arden stood up slowly. He ignored the second guide, climbing close behind him, and stood over the hole while he studied the new pitch that Jessica was climbing. He forced the Kyle Murrian to wait, half in the hole, for several unnecessary minutes, then he stepped away, still deliberately ignoring the guide.

As A'Lween climbed out of the hole unaided, he brought out the length of guide rope from the chimney and passed it to J'Gween. He made no comment about Barth's actions, but he was aware that J'Gween had seen them.

J'Gween waited until Jessica climbed out of sight, found her climb-skill satisfactory, and then he moved to follow her up the slot. He used the same climb-method, balancing with touch-holds of his tail as he moved. He climbed free, not attaching himself to her rope. In fact, he climbed so as to avoid trapping or bothering her rope at all, and he didn't interfere with Doc Barr's protection of the climbing woman.

From his climbing position, Doc watched him climb for as long as he could see the guide. It was a masterful demonstration of skill.

"Ti j!" Doc Barr said, giving the short title the tones of respect that the performance deserved. "The way he climbs makes me feel like an old man."

"I expect monkeys to be good in trees," Arden said flatly. "I'd like to get him on an ice wall at eight thousand meters and slowed down to three breaths per step."

"And you'd make him break trail too, I suppose."

"Hell no! I wouldn't trust his step cuts. Would you?"

"Yes." Doc Barr was willing to admit that he'd trust the guide in any climbing situation, even an unfamiliar one.

"You're the fool, then; I'm not!"

Doc got the signal from Jessica and unhooked from the anchor ropes. He began to climb without looking to see if Arden was belaying him. He trusted Jessica to support him in a fall, knew that Arden would be careless, even if he did tie into the anchor points, and discounted his help.

When he reached the top of the slot and the end of the ledge traverse he was glad to see that Jessica and the chief guide had their packs off. J'Gween was apparently beginning to make camp. The layback had been more strenuous than Doc expected. His legs were quivering with strain and he was glad to see the preparations for a long stop.

"Climb by, Doc," Jessica said. "Pass me your rope and I'll hold Arden. That was a short pitch as leader and I feel like doing something extra. Besides, I'm all anchored." She changed the ropes around her shoulders with a deft reach and flip, before Doc had time to object. "J'Gween says that there's about two hours of light left, so there will be no more climbing today," she went on. "He's got us perched on top of a great wide

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

branch. It's as big as a launching pad."

"I don't care about its size as long as I don't have to climb it right now," Doc said, unbuckling his climb harness and stowing it in a niche of the tree-side. "Can't wait to get at this pack. I want to get my jacket on. This fog's wet."

"It's not as thick here on top of the branch," Jessica said, bracing his pack while Doc opened a pocket. "J'Gween says the air currents blow it clear. The mist should lift clear of the branch surface at dark. We'll sleep dry, anyway."

J'Gween was stringing a perimeter of yellow cord around a wide area of the branch floor, defining the camp area. He finished up near where Doc was stacking the packs.

"If you will unpack the sleep hammocks, Tsa Barr, A'Lween and I will sling them from the back wall, when we return. There is a depression out there in the branch surface." He pointed. "If you put the space heater there, you may gather some reflected warmth and cook rations. There is no fire hazard. The Tree bark will not burn."

"When you get back? Where are you going? I mean where could you find to go?" Doc stopped his unpacking long enough to fire the amazed questions. FitzRoi was climbing alone, but Doc had a more realistic respect for the twelve hundred meters of sheer drop below them. The deceptive smoothness of their climb so far had been entirely due to the guide's selection of route and his subtle, gentle aid, his *Wisdom-of-the-Tree*. Doc Barr had no illusions about climbing the Tree alone. Up or down, he had no desire whatever to climb without the guide's aid.

"We must go hunting, A'Lween and I. We cannot eat your rations, of course, so the Tree must provide food for us."

"Hunting?" Doc Barr was interested. He started to get up, groaned and sat back. "Hunting in this?" he said. The idea of the Kyle Murrians on an arboreal hunt was fascinating, but his aching muscles defeated any desire to join them. His muscles, the fog, and an intellectual knowledge that he could never follow the two guides—not climbing clumsily with ropes and hex-nuts while they chased whatever passed for game on this giant tree. A tree hunt was for them alone. The Tree was their world.

"My eyes see somewhat better in the cloud, I have been told," the guide said. "The mist will lift away from the Tree-side just before dark. We should be back at that time. The hunting will be good."

Barth came up on the branch, took one glance at the obvious camp preparations, swore once, then untied his rope, dumped off his pack and bent to unbuckle the hammock roll. He straightened up with it just as A'Lween came into the camp.

"Find a place for this, Burr-tail!" he growled, throwing the bundle. "A dry place if this blasted tree has one."

A'Lween caught the light bundle,

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

swaying his tail for balance. His ear flattened, his mouth opened in anger and he braced his arm to hurl the bundle back. His eyes narrowed.

"Thrumm! Thrumm! Thrummph! Brother, Tree Brother! Guide them. Guide them! Guard them. Guard them! We hold the hate of the Tree away. Away. Away."

The drums swelled in volume, the sound coming in from all sides in the reflecting cloud mist. The sound stopped A'Lween from whatever action he had been about to take. The violence left him and he turned to join J'Gween where the Chief Guide stood listening to the beat-pattern pulsing up from the ground far below.

"Hear our words, Tree Brother. There is news. From the North the Outworld Law Keeper comes. From Star-Space, climbers who fight, come. Hear our drum. Our drum. The Ca'tn FitzRoi climbs near the Great Stairway Above you. Above you. He goes slowly at the day's end. We had made his climb tiring. He climbs tired. Tired. Tired! Hear our drums!"

The drum sound had been with them all the way as they climbed, but faint, unnoticed. Hidden most times by the wind and air movement across the surface of the giant Tree, the Kyle Murrian drumming was sometimes only audible to the two guides. Doc had heard it once or twice when he wasn't concentrating on the climb, but he had expected to leave the sound behind as the party climbed higher. Nothing had prepared any of the three climbers for the sudden increase of pulsating, rhythmic drum-sound.

"Doc, what is it?" Jessica asked. "We must be four thousand meters up. Do they make drums we can hear that far?"

Doc didn't answer. He was listening. Drum-talk was not always code signals or beat pattern; sometimes it passed emotions and feelings. The trick wasn't in what the drummer wanted to say, but in what he wanted you to think, or feel, when you heard the drums. In this way, sometimes, even strangers could read drum-talk.

"The police have come from beyond the forest," J'Gween said, noticing Doc's concentration with respect. "And others to help us. The Ca'tn still climbs."

Doc shook his head. He hadn't heard anything like that.

"Police?" Jessica said. "Are they going to bring a flier up here to help us after all?"

"No, Mentsa. It is not permitted. And I have been told that the air is thin and bad for fliers near the top of the Tree. But it is also forbidden."

"Rough air currents, Leighton said," Doc agreed. "The wind circulation around a tree the size of this one would be pretty terrific. I imagine that the TSC and the police are more than willing to go along with the taboo, though. Or else they'd be rescuing climbers all the time. Might be dangerous, sooner or later."

"So we still have to chase FitzRoi," Arden said. "And here we sit."

"The Ca'tn still climbs," J'Gween said.

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

"You bet he does," Arden sneered. "Your drums told you that, huh? What do you expect him to do?"

"Grow up, Arden," Jessica snapped. Her temper was too tired to put up with his manner any longer. "We can't climb at night. We can't climb anymore today. I don't know about you, superman, but I've had enough. Now, leave J'Gween alone and settle down for the night, man. Act like you were paying for this climb and enjoy it, why don't you.

"Who's cooking? Doc, can you open a can?"

"Of course, Lady. I am a Cordon Bleu can opener," Doc said, forcing the humor and heading for the depression where J'Gween had told him the heater might be set up.

"We will stay her, *Ti j,*" Jessica said to the guide. "Go on your hunt. And good hunting. Don't worry about Arden. He'll be all right. He's still trying to get over that fall, I guess. A little sleep and he'll be better."

J'Gween understood her words and turned away to collect A'Lween and the huntbows. Jessica was beginning to get used to the abrupt leave takings.

14

Captain FitzRoi had said—presented his planning and said again and again—that he wanted to climb the *Kyle Murre* Tree alone. He was a skilled, confident climber, but he wasn't foolish enough to attempt the climber without a guide. The guide was H'Reeh and he was being scrupulously careful to do a good job even though he didn't like FitzRoi's climb plan—didn't like it professionally, regardless of the emotional climate under which they climbed.

He heard the drum-talk, but had no way to join it. FitzRoi had taken away his drum-sticks, calling them weapons. But he could hear, and he knew of the protective magic that the Hearth Brothers were drumming for the Grove Tree. He also knew that J'Gween was following him with a climb-party.

He knew too that the Tree itself would work against Ca'tn FitzRoi; that the Tree would help the Forest People as it had always done. The Tree would help, even against such a danger as threatened the Grove Lord.

Expertly kidnapped and as expertly tied, the guide had watched the whole affair at the Grove from the Ca'tn's rollogon. He knew the meaning of the trigger box that FitzRoi carried and was well able to appreciate the effect that the explosives would have on the Sacred Tree. This knowledge tied him to FitzRoi as effectively as the climb-rope clipped to his harness.

As for the way the Ca'tn climbed, H'Reeh didn't like it at all, but he guided him truely and waited patiently for the power of the Tree.

FitzRoi climbed steadily, mechanically, seeming to climb to a prearranged schedule, rather than a changing tempo to meet the different bark structures. His pace was not fast, but it stayed constant, hour after hour. Even his rest periods had their unvarying interval, timed by the bell notes of a climb-watch which struck

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

the hour and quarters of his pacing time.

FitzRoi was attempting to climb straight up the Tree. It was not possible, of course, but he quarrelled with every horizontal traverse and forced H'Reeh to find a more vertical path. It wasn't a good way to climb the Tree.

FitzRoi kept the guide moving ahead of him at the length of a climb-rope, shortened so he could keep the native in sight. Kept him moving with a combination of curses and threats if he managed to slow down enough to let the climbing Captain catch up to him.

At local noon, FitzRoi found a near vertical fissure and sent H'Reeh up it ahead of him. They climbed steadily. FitzRoi was forced to devise a technique for setting the hex-nut loops and then pulling them once he'd climbed from stances above, but FitzRoi didn't trust him, and climbed as if he were leading the climb and discounted the guide's help with the ropes. He depended on the guide to locate handholds but tested each one thoroughly before he put his weight on it.

They climbed in mutual suspicion, Captain and guide, but were well into the branch area while the light held.

"Slow down a bit, cully," FitzRoi called, after H'Reeh began his second horizontal traverse to the left, around the titanic overhang of a branch. "Let's cut the rope length down a little." He pulled in some slack and locked it in a carabiner clip on his harness. "I want to see which way you're going in this fog.

"Now, find me a path around the *right* side of this one. We aren't going straight any more."

"The easiest paths are on the shadow side of the branches, Ca'tn," H'Reeh said, truthfully. He hadn't been trying to deceive. "The bark fissures more firmly without crumbling."

"Forget it! We go around the other way on this one. Keep climbing."

"Ca'tn, it is time to stop and set up a camp. There should be a good place on top of this branch, but it will be near the shade side. If we . . ."

"All right! Climb! Go left, if you have to. I'll angle us back on the vertical at the top of the branch. But we're not stopping, so forget about camping."

"Ca'tn, we must stop," H'Reeh started off to the left taking the safe pitch around where the bark was wrinkled and patterned into two and three-meter hexagons—easy hand and finger holds. He led along a path he knew that FitzRoi could climb, guiding him well. And he kept on talking: "No one climbs on the Tree at night, Ca'tn. Also I must stop and hunt to eat . . ."

"Not a chance. You're packing your rations, Fuzz-ears. I found out that you Kyle Murrians use iron rations too; stole enough to keep you going. Do you think I'd let you out of my sight? Let alone give you a weapon for hunting. No way! Keep moving!"

"Until the sun sets, Ca'tn," H'Reeh insisted. "There are other reasons for not climbing when the

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

light of the day fails."

"You can forget about them. I've climbed in the dark before. If you haven't, you'd better start learning."

"Ca'tn, I know the ways of the Tree. We must camp. There is a good spot just there. See where the cleft forms." They were on top of the branch now, and H'Reeh pointed to the site he meant, just barely visible through the cloud mist.

"Up! Keep climbing!"

H'Reeh turned back to the Tree and began to move upward again, obeying because of the clear knowledge of that threatening detonator and counting the risk he faced of less matter than the loss of the Grove Tree. He headed up toward the next branch system, climbing as fast as he could move and still be within the Tree-skill of the Ca'tn behind him. He would try to get to the top of the next branch and beg for camping time again. There were dangers on the Tree, even for Kyle Murrians, and H'Reeh didn't want to be caught on the vertical face of the bark wall when that danger came to meet him.

That was the pattern he set, fast climbs between the branch systems and a traverse across the surface of the branch while he tried to delay FitzRoi; convince him to stop.

The pace was acceptable to FitzRoi, but the delays weren't. And the delays got longer as the light faded from the cloud mist. FitzRoi was about to stop and try a little beating—he didn't want to detonate the Grove Tree; loss of that final threat would destroy any hold he had on the native guide. *"Probably have to kill him, then,"* FitzRoi was thinking. *"On top of the next branch, when he pulls his stall, I'll put a couple of rings across his head . . ."*

"Ca'tn! Come up, quickly!" The guide was pulling on the safety rope, almost jerking FitzRoi off his holds.

"Let go, ape! Slack off!"

"Climb fast, Ca'tn. Up on the branch! We must get off the bark. Quickly!" H'Reeh kept the tension on the rope urging FitzRoi up onto the top of the branch, then tugging at his arm to pull him across the surface toward the Tree wall where the branch joined the main trunk. "Here! In the cleft! Quick! The *valachi* are coming!"

"Let go of me! I told you never to touch . . ."

But the guide's quick tugging had pulled him off balance and FitzRoi took the few stumbling steps toward and into the shelter of the fold of Tree-bark. As he whirled to defend against what he supposed was the native's attack, he heard the scrabbling scrape; the whistling, hissing calls and the scrabbling coming from above them, out of the cloud mists. The fold of the cleft magnified the sound so that he heard what the guide's sensitive ears had picked up seconds earlier.

A dark shape moved in the mist, climbing down the Tree, past the curve of the branch. The hissing call came again.

FitzRoi faced outward, peering to catch another sight of this new menace. His hand fumbled in his anorak.

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

"No, Ca'tn. Do not destroy the Tree. It is not any of our people. The *valachi!* The *valachi,* Ca'tn. They are eaters of life on the Tree. Animals, Ca'tn! Stay very still. That one you saw is not alone. The *valachi* do not hunt alone."

"Hunt?"

"Yes, Ca'tn. Please do not move around. They are very nearly blind, but they can sense movement and will run at anything that flees from them. Please hold very still. Aactha! The pack comes!"

FitzRoi had seen the forms moving out of the fog. His hand came out of his jacket, not with the detonator, but with his needle-gun. He changed the narcotic needles for a red-striped clip of high explosives. The creatures coming at him down the Tree-bark, through the mist, weren't something he wanted to put to sleep. They were horrors that needed blowing to Hell. Dog-sized, they had wide triangular heads that moved searchingly from side to side and thin, insectile legs that carried their furry bodies close to the bark, but let them run with easy strength in their vertical head-down climb. There were ten or fifteen of them visible in the pack as it spread out onto the surface of the branch and started across in front of where the two climbers stood hidden. More came out of the fog behind the leaders until a slow moving migration covered the Tree surface.

Two of the *valachi* lifted their heads and gave a weird cry. FitzRoi saw the open mouths and the pointed, saw-toothed fangs that told him these were no vegetarian tree dwellers. He froze into combat-stillness, the barrel of his needle gun trained on the closest animal, following it through a tiny arc then swaying back to the next animal in line. As long as the hunting pack moved past they were safe. If one of the *valachi* turned aside the whole pack could be down on them in minutes. FitzRoi intended to kill the first one that swerved, otherwise he would let them go on by.

"Come back from the opening, Ca'tn," H'Reeh whispered, risking a tug at the man's jacket.

"Don't touch me!" FitzRoi snapped. "You fool!"

His needle gun spat its stuttering whine. One of the *valachi,* attracted by the guide's slight move, or just turning off course, had started a weave toward the cleft. FitzRoi's explosive needles blasted its head apart; cut into the gross body and tumbled it down, the stick legs scrabbling in a frenzy of death movement. Instantly, before FitzRoi could fire again, three of the nearest *valachi* whirled on their fellow animal and began to tear it violently to bits. The blasting shockwaves of the explosions, the swirl of movement, attracted the running attack of two more, who started hungrily eating the living *valachi.* They went wild, scrabbling, as the attackers and victims alike moved along with the migration. Another feaster attacked the group as they moved deeper into the mist, but the rest of the steadily moving pack seemed to ignore the combat and kept

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

to its dreadful, steady pace.

"Hunger drive! Death ecstacy!" FitzRoi said, recognizing the behavior pattern. Then, trusting the scrabbling *valachi* combat to hide his movements, he raised his pistol, sighted on a target on the far side of the moving herd and fired. He shifted his aim and the explosive needles brought down another target. He's killed two *valachi* in the line of march, as far away from the cleft as he could aim. The expected killing fight developed and the herd quickened its pace as it flowed toward the source of movement. Chasing and eating their own dying members, the *valachi* moved away from the hiding climbers in a ragged swing of massed attack. FitzRoi's last glimpse was of two of the beasts crawling off down the vertical tree-bark, tearing at the body of a third that they carried between them, and scuttling head first down over the bark pitch that FitzRoi had just climbed.

The whistling and hissing died away in the fog, as the brawling herd of beasts passed lower down on the Tree.

"You win guide," FitzRoi said, replacing the narcotic darts in his pistol and tucking it away. "We don't climb at night."

15

Lower down on the Tree, J'Gween heard the explosive shells and correctly interpreted their meaning. He hooted a call-back signal, but unnecessarily. A'Lween came climbing along a horizontal traverse, returning swiftly.

"Danger! Danger! Danger! Danger!" The drum beats were throbbing their quick-beat warning, carrying J'Gween's signature and FitzRoi's name-beat mingled in their pattern. *"Brother! Brother! Brother! Danger comes! Guard! Guard!"*

"Valachi," A'Lween said, not expecting J'Gween to answer.

The Chief Guide didn't, nor did he trouble to drum a reply to the village. He turned and led the way swiftly back to the branch site where he had left his climb party. The branch-camp that he'd selected was not normally on the *valachi* feeding route, but the Outworlder's shots might change their migration path. J'Gween hurried.

Arden Barth was awake. He'd heard the shots too and was staring up the Tree, trying to place their location, estimate how close they were. When J'Gween came scrambling into the camp, down the Tree bark, he asked; "FitzRoi? Was he shooting at you?"

"Wake them up, Tsa!" J'Gween was no longer a subservient guide, his tone commanded. "Take the packs deep into that bark fold. Swiftly! There is great danger! The Tree is home to carnivore that attacks at night. Wake them!"

Barth moved to shake the girl, punched the doctor. He picked up the urgency in the guide's tone and moved without argument. Scooping up his pack and the coil of ropes, he herded the other two half-awake climbers into the deep bark canyon at the back of the branch. He came back to bundle the three sleeping rolls into an ungainly mass which he stuffed in behind

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

Doc Barr. Doc had recovered from his sleep shock enough to take the mass of bedding from Arden and tug it into the back of the cleft. He finished by pulling the packs back there where they would be out from under foot, then he joined Jessica and Arden near the mouth of the cleft where they were watching J'Gween and his assistant.

The two guides were stringing a wire in front of the camp site, moving rapidly. A'Lween pulled a micro-pile from a pocket on his pack and hooked it up.

"Electro-fence?" Jessica said from behind Barth's shoulder. "What's happening?"

"We were eating cold rations and building stick fires, when all the time he was lugging that power source along." Doc was more concerned by the insult to his creature comfort than the threatening danger, whatever it was.

"Carnivores, he said." Arden was watching the guides. That was all the answer he could give Jessica.

A'Lween came directly for the cleft, J'Gween followed him carrying their climb-packs.

"Back! Further in the cleft, Tsarias!" J'Gween ordered, passing his pack to Arden. "You must stay hidden and remain perfectly still. The *valachi* will charge at any movement whatsoever."

"*Valachi*?" Arden was feeling stupid. He'd asked three questions in three minutes and still didn't know any answers. But the haste that the two guides had been showing indicated that they'd all know the answers very soon. "Oh, I'm sorry, you said quiet. But can't you tell . . ."

"Talking is all right, Tsa. I meant physical movement." J'Gween faced outward. A'Lween had joined him in the mouth of the cleft and they had their huntbows leveled and cocked. "You heard the shots? I expect the Ca'tn met a feeding trek of the *valachi*. He may have turned them toward us. They are dangerous and hiding is the only defense. So, for a moment we will hide."

"You still haven't answered . . ."

"Look, then," J'Gween said. "The *valachi* come." He moved his head slowly, pointing with his chin and Arden, following his gaze, saw the first vanguard of the heavy-headed carnivores.

"Good God!" he said, softly. "There's more."

"Stand very still!" J'Gween said. "There will be many more, Tsa."

"Let me . . ." Jessica leaned forward against Arden and caught sight of the moving wave of animals as they came visible out of the fog and darkness. She gave a short scream, strangling it off as she fought the panic desire to run.

"Doc, stay where you are," Arden warned. "They'll be opposite the mouth of this canyon in a minute, you can see them then. Don't move, anybody!"

The herd of *valachi* had split as it came down the Tree-face. Part of it—five or ten, so far, moving in a paired column—moved onto the

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

branch and across it. The balance of the swarm continued on down the Tree on the far side of the trunk.

The climbers watched, motionless with horror as the hissing, whistling monsters paced by.

"That single wire won't stop them," Jessica whispered. "God, look at those teeth."

"The wire will help hide us, Mentsa," J'Gween said. "The TSC showed us how to . . . Look, Tsarias"

Arden and Jessica were treated to the spectacle of the *valachi*'s cannibalism. In two places, the animals brushed against the electrified wire and were thrown, twitching, into the pack. The unnatural movement triggered the *valachi*'s hunting implant and the three closest started tearing at each of the fallen beasts. They, in turn, were attacked and the air was filled with their hissing screams.

Jessica hid her face against the back of Arden's shoulder to block the sight, but was unable to keep it there. She had to see what they were doing. Doc started swearing, his voice rising in violence unconsciously, to carry over the herd noises.

Then the herd was gone, scuttling over the curve of the branch and down the Tree, taking their gory feast with them.

Arden saw, or rather felt Doc's movement as he put the pistol back in his jacket pocket, and realized he had drawn and was holding his own needle gun. His hand quivered with the reaction as he shoved over the safety and put the gun away—narco-darts wouldn't have helped a bit against those . . .

"They attack the movement on the wire and ignore us while we hide," J'Gween said, uncocking his hunt-bow. "I did not plan to take you into this danger, Tsarias. The Ca'tn's shooting drove them down on us. But they are gone for the night, now. The *valachi* do not feed back on their own track. You can sleep safely now, although, perhaps you would prefer staying here in this shelter. Our camp area is no longer pleasant."

"Sleep?" Doc said. "I don't think any of us will sleep any more tonight."

"You couldn't close your eyes," Arden admitted. "You'd keep seeing those teeth. God, what brutes."

"I'm not leaving here," Jessica said. Her voice was still tinged with the hysteria that had touched them all in the incredible violence of the *valachi* migration.

J'Gween moved out of the cleft, first asking for his packs, then taking A'Lween and leaving the Out-worlders to themselves. They would recover from their shock best if nothing of *Kyle Murre* was near to remind them of the *valachi*. And they must get back their self-confidence, lose the fear that they felt or the next day's climbing would be dangerous.

"Brothers, Hearth Brothers. We are safe. Brothers, we are safe. Thank you for your guarding. Thank you. Now, they sleep. Now, they sleep."

J'Gween stood on the edge of the Tree branch and stroked his drum

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

sticks, looking up the Tree and wondering about Ca'tn FitzRoi. Was he still alive? Had the *valachi* herd overrun him? No, he must also be safe or the bomb trigger would have been set off, exploding the Grove Lord, and the ground drums would not be still beating.

"Brothers, Hearth Brothers, your guarding protects him too," he said aloud, then ended his drumming with a thank-prayer beat to the Tree itself and simply stood still looking up into the Tree.

16

The second day's climb started well. There seemed to be no ill effects from the night's violence and tension. After the *valachi* had left, Doc, Jessica, and Arden had stayed in the cleft throughout the night, talking excitedly and pointlessly in their relief, until there were only a few hours until morning. Then, despite her protestations, the two men had talked Jessica into wrapping up in her sleep sack and she had fallen asleep in seconds. Doc, an old campaigner, knew he couldn't continue to climb without rest and had run through the three-mantra exercises he used for high altitude sleep and started to snore. Arden in the end, faced with two sleeping bodies, found his eyes too heavy to keep open. J'Gween wisely let them sleep until the sunlight through the cloud was bright enough to make shadows.

The late morning start brought them back onto the Tree-bark, refreshed and climbing strongly behind J'Gween, up throught the cloud-shrouded branches. They climbed around the bulging branch roots and continued on, not stopping or crossing onto the branch surface. J'Gween didn't want to remind them of the *valachi*.

Near the end of the second hour, they were working up through an area where the bark was patterned into large hexagons, *The High Islands*, J'Gween called it. Here a wild morning wind was scouring the surface of the tree-bark and the guide kept them climbing in the trenchlike grooves between the great bark blocks. The wind only tugged at the top of Arden's head, or shoulders, in spots where the trench was shallow. They were out of the wind, but the climb path was twisted and torturous; a maze, up the side of one block, across the top, along the angle of second and over the top of the third; continuing from one block to the next, and on . . .

Jessica was climbing in the lead position again. Arden Barth had set up a belay anchor at the lower corner of one of the bark rectangles then had let her pass him and work along the base of the block to a position where there was a clear climb up along the side of it. The plan was that she would find a belay spot and anchor their safety line while Doc Barr climbed up to meet her, then Arden would follow. By this means, the order of climb would be reversed again.

This was the climb method that they had become accustomed to in order to provide some variety in the technique of their work up the Tree. It helped

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

overcome fatigue and kept their muscles from the numbing overwork that could come from repeated actions.

As she started up the far side of the rectangle, Jessica found herself climbing an area that was adjacent to a branch. The curved swelling of the branch was bulking upward, overhead, twenty-five meters to her left. She was working up a surface that was serrated with lots of short ledges and cracks running across the slope of the surface. These ledges were at right angles to the side plane of the bark rectangle, and the cracks were roughly vertical to the ledges, forming a chequering that duplicated the bigger bark rectangles. The ledges enabled Jessica to climb them like stepping up a ladder. However, they were not wide and she could not get her whole shoe on one unless she placed her foot sideways. A full-boot foothold on any ledge meant contortions that she couldn't hold for long. Also, the small ledges gave her very little purchase for her handholds. In some places she was using fingertips to hold a three point stance while reaching for the next purchase; in some places, the side of her hand and wrist.

The bark cracks were chancy too, varying from too small for her stopper nuts, to large enough to need two of the largest size she carried. This made the choice of location for her safety rope loops difficult, but so far Jessica had managed to avoid any long traverses or climbs without protecting herself with a stopper nut and a carabiner clip for her safety rope. The rope now hung through six good stopper points, back to where Arden Barth was holding the belay supports, feeding the rope out to her. Six loops, but only one of them was on this difficult stretch and it was back below, near the lower corner of the bark rectangle.

For some time now, Jessica had been climbing on a surface with a definite slope to it. Not an overhang, but a slope the other way, helping her climb by changing the angle of her weight. Now, as she moved and relaxed her muscles, her body tended to lean against the Tree. The angle of the slope was not great, barely twenty degrees off the vertical, but it was enough to trick Jessica's balance centers into an exaggerated illusion that she was being supported by the slope of the ground. She was tricked momentarily into forgetting two things. The first was that she was climbing a Tree and not a mountain slope. The second thing she hadn't noticed was that her center of weight was only twenty degrees away from a fall. The slope hadn't made her careless, she was still climbing carefully. It had merely tricked her.

The nature of the chequering on the slope was such that she hadn't been able to find an anchor point for her safety line and this was demanding more of her attention than the actual slope itself. She didn't believe she had climbed too far beyond the last anchor point for safety, considering the working stress of the rope and Arden's secure belay, but she had begun to worry a little. The cracks in

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

the bark were either too small or too large. She would have driven a piton for her clip if she had had any. The small cracks were right for that . . .

Jessica searched the slope above her carefully for the right sized crack. She had to find one soon.

A scrabbling scrape on the bark at her left caused Jessica to jerk her head that way.

She screamed!

A valachi was moving out of the vagueness of the cloud, scuttling quickly down over the curve of the bulk of the branch surface, and headed straight toward her. She could see the blind stare of the eye cells on its triangular head. Jawlike ridges along the side of the armored head, spined with "teeth," made a clash and clatter so loud she could hear no other sound. She screamed again and lifted an arm in front of her face.

Her scream startled the *valachi* into a whirling turn up the Tree, higher, away from her and into the clouds again. On the instant it disappeared, Jessica heard J'Gween yell. Then the snap of his huntbow was loud in the cloud-wet air. Jessica heard a roaring growl. It was an angry, fighting howl; coming from a Kyle Murrian throat. J'Gween was alone up there! The *valachi* had attacked him. Those sounds couldn't mean anything else.

The huntbow snapped again. This time the cry that followed was the whistling scream of the *valachi.*

Jessica started, half rolled her body to the right, pushed up with her arms, and lifted her head to see. Her knee came down on a carabiner clip and the nerves flashed yellow, red, and black colors behind her eyes. The pain jerked her leg straight and she lost a foothold and rolled further to her right, hitting the tree-bark with the bundle of carabiner clips rolling under her side. For an instant, as she twisted her body to catch her balance, the clips rolled beneath her, acting like friction bearings. Her side and hips slid and rolled on the moving carabiners instead of clinging to the rough bark under the action of her weight and friction. For fatal instants, the carabiner clips destroyed her friction.

Jessica slid sideways. She lost her other foothold in the first quick lurch; her right hand was torn away from its hold as her whole weight came on her fingers. She threw her left arm out sideways, searching for a crack—a ledge—a handhold that she could lock onto. Her feet searched frantically for some projection, but they found nothing for long seconds.

In these seconds Jessica began to slide!

She was still in contact with the Tree bark, lying twisted on her right side, from the waist up facing the bark, with her right arm overhead. She could feel the rough scrape of the bark against her face, but there was no sense of pain. Her whole being was fined down, concentrated, into the effort of finding some support for her feet. She was feeling with booted feet suddenly so sensitive that the barest contact with the Tree stung her toes

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

and tingled the skin of her soles. Her feet found no purchase.

She kept on sliding. Her head lifted, looking for the fingergrips her hands were seeking as swiftly as her feet. She didn't dare raise up too far. Her slide was not fast. She hadn't stopped yet, but it was still slow and Jessica didn't want to disturb her splayed position on the slope. The risk was a tumble or a snag sideways to start her rolling. Then the only thing to stop her fall would be the long drop to the slack of her safety rope and the last check nut she'd planted... That and Arden Barth's strength and skill on the belay.

There wasn't time to worry about that, or about the breaking strength of the perlon rope. The thoughts flooded across her mind with the adrenalin driven clarity of the fall and were gone with the reliance of faith. There were other things she had to do.

Her right hand found a wide crack. It wasn't a hold. It was a fissure into which her hand went as it searched.

Without control, on instinct alone, Jessica shoved her hand into the crack and closed her fist. Then, with as much speed as she could force out of her odd position, she pulled her left hand over, grabbed her wrist, and pushed her arm into the crack.

Her body continued to slide for another ten centimeters, then stopped with a wrench that jerked her shoulder and twisted her hips half around. Her feet swung wildly and the carabiner clips at her waist and back chimed a discord.

Her wrist flared a burning iron ring of pain, lost skin, oozed blood, and became a living stop-nut to lock and hold her in the crack—to hold her on the Tree.

She heard the fighting howl from above her again, followed by another snap of J'Gween's huntbow. Next a warbling, hissing scream shrilled. A sound that cut off sharply as it fell away below her. The *valachi* had been killed...had fallen...had fallen.

The thought of a fall brought Jessica back to her own slide and the pain and shock washed over her in another wave. Color went out of her vision and her skin shrank from her clothes in a cold shivering that had a sharp pain of its own. She was nearly unconscious, seeing nothing, feeling nothing. The pain level in her wrist concentrated into a dull fire that blocked the nerve signals with numbness. The anchor of her fist and arm was virtually permanent. She would never get loose now, certainly never fall.

Her shock slipped closer to blackness.

Doc Barr saw Jessica slide. He had been watching her for some minutes, measuring the length of safety rope that was hanging below her to the carabiner clip at the corner of the bark block, and doing a mild worry. He considered that she was getting too far from that clip and had glanced over to check Arden's alertness at the belay point. By that brief look away, he missed seeing the *valachi's* rush.

He heard Jessica scream!

He coiled his spare rope swiftly,

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

looping the rope coils over his right shoulder and tight under his left armpit for free climbing, his hands moving with their own skill. His eyes never left the sliding girl. He didn't waste another look at Arden. Jessica's scream carried a message that would have alerted any professional into bomb-proofing his belay and taking the proper action, instantly.

Jessica had stopped sliding!

Good! She'd caught a foothold. No...Her feet were still moving, searching...a handhold then...but she couldn't hold her weight long on one hold...and she wasn't moving anymore...but there was time...

Doc started climbing.

He was almost directly under Jessica, but his first move was up the lead of the perlon rope linking him to Arden. He had watched Arden and Jessica both climb this pitch and knew all the foot and hand leverage points. Also Jessica's route out to the corner of the bark block was along a continuous ledge. Doc knew he could climb this way faster than he could search out a new path directly up to Jessica. Then too, once he reached Barth, he would have the added safety of Arden's belay anchor to protect him when he brought Jessica back. Doc hurried. Unclipping the guide rope, he brought it up with him as he climbed so as to have it available when he reached Barth's position.

He heard the noises of J'Gween's huntbow and the guide's howling yells. They seemed to carry a note of anger more than hurt. Doc had never seen a Kyle Murrian fight—although the Marines had taken their riot potential seriously—but he did remember the guide's heavy claws ...and the huntbow sound was loud enough in the moist cloud air. Whatever the guide was fighting, the noises didn't sound like J'Gween was getting hurt. Doc kept on climbing.

"Did you see what happened?" Arden asked when Doc came up beside him.

"She slipped down about twenty-five meters," Doc said. "She's got a hold, and hasn't fallen yet. I'll need all the short working rope you have." He reached Arden's equipment harness.

"There's no strain on the safety rope," Arden said and nodded in agreement.

Doc was tying his safety line onto Arden's belay anchor and carefully leading it around Barth's body and along his arm. Placing the second line so that it paralleled the rope leading to Jessica and would not tangle with it. Arden nodded again to sign his understanding of Doc's maneuver, and took the second rope in his left hand. He carefully transferred both lines so that he could grip them together. He took a few seconds to relax the tension in his hands by opening and closing them, then took up his belay grips again and prepared to hold both ropes in easy, relaxed fashion until the instant his strength might be needed. The first muscle tension, caused by Jessica's scream, was gone.

Doc watched him flex his hands and was ready to cue his own movement

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

when Barth firmed a grip on the paired ropes. Doc was already moving, on his way along the horizontal ledge, at the same moment that Arden said; "On belay!" He didn't waste breath replying. Barth could see him leave.

Doc climbed along the ledge quickly, but at each stopper loop he came to a full stop, clipped his own line in place and gave the loop three sharp tugs to test its security. He had to know that it would hold him...hold both him and Jessica—on the way back.

Beyond the last stopper loop there was no place for another loop. Doc could see why Jessica had threaded her safety rope out so far. He swore softly. The narrow ledges were going to make things difficult.

He followed Jessica's rope up the slope because he wanted to see if it would be possible to bring her back down that way. The purchases were not wide, but there were enough of them so that climbing down shouldn't be hard.

He stopped briefly under the form of Jessica.

Easy! What he did now could be very dangerous. Jessica was straining her resources into that one handhold. When she heard him arrive to rescue her she might relax, or give a start of alarm, or, in stress of fear, do anything... The situation was much like a drowning victim...and it was nothing to do with her femininity... he had seen strong men cling hysterically to rescue mountaineers and jerk them both off the rock, to the limits of safety rope... Slow and easy...!

Doc picked solid footholds and one good hand-ledge. He was up beside Jessica now; she showed no sign of having heard him. He unclipped one end of the short safety line that was hooked to his body harness and reached across to hold the clip near Jessica's straps. He didn't touch her.

"Jessica." He spoke in a normal tone. Whispers can scare. "It's Doc. I'm right beside you. Don't move. Jessica can you answer me?"

"Doc?" Her voice was pitched high. "I stopped the fall, Doc." Her voice was high and she still didn't move. *That* was fine; Doc didn't want her to move just yet.

"Jessica. I'm going to clip a rope on your back. Hear me? Don't let go. I can't tie you off up here. Hear me? Don't go! This is just a link."

"Hear you...can't let go..." she said. Her voice went out of control and breathy. Doc thought the last word was, "bomb-proof..." He took a chance that the first, "Hear you," was an answer, not a repetition, and hooked the carabiner clip into her harness strap. She gave no sign that she felt him. Her back might have shivered, or it might have been a catch in her breathing. Doc couldn't tell with the bulk of her anorak. At any rate, the safety line was hooked. Now, Doc's footholds were supporting Jessica, and there was a double perlon rope back to Arden Barth's anchor.

Doc shifted his handhold and stepped up one ledge. That was all the

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

slack the connecting rope would give him. He wanted to see Jessica's handhold and he hadn't been able to do so before this, but he wanted to keep Jessica linked to him. He stepped up one ledge...

He swore again, softly. The word he'd heard her say *had* been, "bombproof." Using your own hand and arm like a piton or a stopper nut was an acceptable climbing technique. You didn't need to use it everywhere—Doc had never had to, but he'd met men who had done so, or said they had. But no one had ever claimed the need to perform the trick this way! Doc was sure Jessica couldn't release herself. For that matter, he wasn't quite sure how *he* was going to go about releasing her.

First: get her weight off that arm... Before something breaks. If it hasn't already. Doc was climbing back down to a point below Jessica. It was a short distance but he found the work difficult—all out of proportion to what he'd expected when he first came up. The ledges were so small and close together that he could not be sure whether he was actually stepping down far enough...whether the next ledge would be better, or too far below. Because of the slope he could not look down comfortably without losing a handhold. And they too were meager. Six steps downward and Doc became very worried about his ability to get Jessica back down to where Arden waited.

First things first...

"Jessica. I'm going to move your feet," he said, controlling his breathing and trying to sound normal. "Hear me?"

"Doc. There's nothing under my feet," Jessica said.

Doc Barr reached up quickly and pressed her right boot hard against the Tree bark. He didn't want to hear that tone in her voice again.

"Don't fight me now," he said. "Up! ...And to the right. Here's a ledge." He moved her foot, planted it on the ledge, and felt her leg muscles tighten. "Don't try to stand on it," he said evenly. "Just pressure. Pressure, Jessica!" He wanted her to keep that armhold until he was sure she could climb. He changed his handholds and pulled her left foot across until her toe and then boot heel were on a ledge just a little lower than her right. Her right leg was bent and if she stood up on it, she should be able to free her hand.

"Don't move yet. I've got to work out something," he went on. "Leave your arm where it is. Hear me? Don't try to move yet. You might black out...or something. You hear?"

"I hear. Thanks for the feet."

Doc nodded. It was always better to be standing on something. Your feet gave you a base to let your mind work on. It was a problem of feet that was occupying his mind now. These ledges were too bloody small for comfortable thinking and they would be a vast problem when it came time to start down with Jessica. He had no way to belay her on this chequered slope and it seemed certain that she would miss a step and fall again once

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

she left this one place where she was stable. If he went down right below her, even shoulder to hip, they both would fall. The holds just weren't wide enough for that sort of work. Doc wasn't all that confident of his own ability to climb down the route he'd taken to get up here.

Up? How far was it to the top of the bark rectangle?

He lifted himself a little and looked up across Jessica's pack. The clouds made seeing difficult, but that had to be the upper corner of the bark rectangle; the shape and almost straight line of the scarp make it certain. That meant a flat, stable resting place that wasn't more than twenty-five meters above them. Details of the Tree surface weren't clear, but he could see that much. Twenty-five meters was an easy climb for him and it should be simpler to take Jessica up to a level on top of the bark rectangle, than to try and shepherd her downward and across to Arden's belay point. He wasn't sure how much use Jessica would have of her right arm after she released it from the crack, but he thought he remembered a trick so he could try for that too.

"Jessica," he said. "I'm going to climb up higher and anchor a rope. Hear me. Don't move. I'll be right back.... Won't take long. Wait! Hear me?"

"Yes, Doc. Don't move. I hear." Jessica wasn't wasting words and Doc was glad to hear that his presence near her hadn't triggered any panic. Still he'd better hurry. Her reaction might be just shock. Her arm must hurt more than she could feel. It would hurt worse when he lifted it out of the crack, but after that he could do something for the pain.

He started to climb, then remembered one more detail.

"Barth! I've got her! All right here!"

"Yo ho!" Barth answered.

"Hold belay. I'm going higher and set a rope."

"On belay!"

"Doc," Jessica said. "J'Gween was fighting one of those... things...up there."

"I heard," Doc said. "It's quiet now, I'll be all right. Back in a minute." He started up the slope, checking the best ledges as he went. At the top of the bark rectangle the treacherous chequering stopped and he found the deep bark fissures that had been common all the way up the Tree.

His sigh of relief was shortened somewhat by the strain of his climb, but it was loudly sincere. Almost directly in front of him was a widespread crevice formation that was perfectly placed to serve as the anchor point he wanted. When Jessica made her climb this far she would be on the flat top of the bark rectangle—a perfect resting place. He put in one stopper loop, hooked his body harness to it, and reached out to set two more loops. In a short time his skilled hands had a three-point tie knotted into a two carabiner clip-set and he was tying a double length of the

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

spare rope into the clips. He took another long minute to test each stopper nut, with a violent jerk and his full weight, before he did anyting else. Then he wrapped the bight of the rope under the back of his thighs and back up before his chest where he could construct a three-carabiner rappel lock. Finally he tied on a short prusik strap to his body harness. He placed the sliding knot a hand's-width above the rappel lock and checked everything over; pulling himself up a bit and sliding the ropes through the clips to make sure they worked. He did all this very rapidly and cleanly, with no lost motions. This sort of a rig was one he used every day to come down off his cliff site at *Muggedore II.* He handled the ropes with easy skill.

"Barth!" he called. "Coming down!" On rappel!" He heard no reply and stopped his motion—he'd been ready to unhook the clip holding him to the three-point anchor. Barth hadn't answered. Probably the big bark rectangle was blocking the sound. This cloud made noises echo strangely.

"Jessica! Tell Barth! I'm rappelling down. Call him!" Doc had to wait until Barth understood what the slack in the safety lines meant. An overreating pull could spin him and he'd lose control.

Jessica's voice called faintly, "Barth!" Then it was lost as her words faded in the vagueries of the air. Doc next heard her call "Yo ho!" That was an obvious repeat of Barth's call and Doc flipped his safety line clear of the rappel rope and braced his feet against the Tree bark.

He unclipped from the anchor and started walking backward down the slope, supported by the ropes and controlling his drop by the friction of the strands across his back, as he stepped downward to Jessica. When he reached her, he locked the rappel clips and tied off the tail rope to make a sling. His feet found a foothold ledge again and one hand slipped into the crack that was holding Jessica's arm. With the other hand, and a carabiner clip, he linked Jessica's harness to one of the two ropes that was holding him to the three-point anchor above them.

Jessica heard him scrabble into position beside her. Something about the sound frightened a little cry out of her, but she was looking at him as he came down and could tell where the noise came from. Doc saw the fear darken her eyes and then brighten away as they grew wet with something close to tears.

She felt the clip and the rope too and objected.

"Rappel? No, Doc. I don't think..."

Doc was busy tying another short rope into her harness, his hands working between her body and the Tree, looping a sling up to knot around the rappel rope, just level with her eyes—another sliding prusik knot.

"Not down," he said. "We're going up."

His rope work was all finished with

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

this final knot and he tightened his own sling, moving the sliding knot and relocking the rappel clips to let him stand a little higher.

"Now, Jessica," Doc said. He tucked two bandage pacs from his medic-kit into the collar of his anorak where he could get them fast. He kept his voice steady. "Now, Jessica. When you're ready, I want you to stand up on your right leg. I'll take your arm out. Let me do it and don't worry about a handhold. The ropes will balance you. Understand? Trust the ropes."

"Yes, Doc. Stand up...and trust...you."

"When you're ready," Doc said again and took hold of Jessica's trapped arm, from underneath, as close to the Tree bark as he could place his hand. He felt a shudder go through her body, then she forced herself to straighten her bent right leg, pushing up along the bark. Her breath moaned out in a low cry with the effort.

Doc reached up to grab the cloth around her forearm and pulled her wrist straight up the crack. At the same time he pushed the back of her bent arm. His concern was speed, a quick move, before she had time to react and jerk against him. A mistake could break her arm.

Jessica's arm came out of the crack easily. Doc heard the gasping rattle of her inhalation as the blood pumped into the wrist and hand. He took her arm into the crook of his own elbow, blocking the crack with his shoulder so that she couldn't, even accidently, repeat the trapping wristhold.

His fingers probed the forearm bones and the back of her hand for the humps of broken bones. He felt nothing. Even the skin abrasions were slight. Doc's medicine was the rough and ready kind he'd learned in field experience. A dig-site crew gets an amazing variety of accidents, though; Doc was a good blood and bone fixer. Also the Tree had not done the tearing damage that Doc would have expected from a rock cliff. Gratefully he tore open a bandage-pac and wrapped the wrist with the self-adhesive plastic. The pac-pad was coated with an air-foaming narcotic gel that would kill the pain and slow any swelling in Jessica's wrist and forearm. The gel was a swift and vital first aid for sprains that would otherwise cripple a rock climber in dangerous places.

Doc's next action was to open Jessica's closed fist and then grip it again, around the rappel rope just below the sliding prusik knot. The second bandage-pac, wrapped around her hand, would keep the fingers from opening as well as soothing them.

"Don't try to grip the rope, just push the knot up," he said. Jesica had watched him tape her to the rope. Her eyes were wide with questions. "We're going up. Three point climbing. The prusik's your right hand; just push it up.

"Try it!" He was urging her to get her moving before she could refuse the idea. "Find a hold for your left hand and pull your left foot up. Go ahead!"

Wonderingly, without saying

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

anything, Jessica looked up to her left, reached for a ledge, gripped it.

"Just balance up," Doc said quickly. "The ropes won't let you slip."

Jessica lifted herself sideways and felt with her boot until it found a ledge. Then she shifted her balance away from the ropes and put pressure on her feet and her handhold. "*That's all it takes,*" someone had told her long ago on a rock climb. "*Just pressure against any three points and you're climbing. Don't climb or lift or tire yourself; just pressure.*" She looked at the prusik knot and her bandaged arm. That move took a full arm push from the shoulder, but the knot slid up and locked on the rope. *Three points.*

She took another step. Up!

"Barth!" Doc called back to Arden. "Climbing! On up!"

"Yo, ho! On belay!"

Doc followed Jessica closely, keeping the rope tight with a loop through the rappel lock and around his back. He kept pulling it tight as he climbed to keep the lock clips holding on it and to make Jessica's climbing easier.

The twenty-five meter climb was a long trial for Jessica. She was surprised to find that her right arm and shoulder were capable of doing what Doc asked her to do. Her arm muscles were almost working normally by the end of the climb. The strain came in her legs and in her breathing. Despite the balance of the rope and her left hand, she was really doing most of her climbing with her legs. Relaxed balanced climbing, pressure climbing, had to be just that *balanced*: an equal effort of all major muscles, lungs, and cardiovascular system. With part of her climb-balance gone, Jessica had been working the rest, arms, legs, feet, hands, and heart, too hard. At the end she was quite willing to let Doc tell her where to place her feet and hands. She was supremely glad that Doc had elected to climb for the flat top of the bark rectangle. When she reached the three-point anchor, the flat was there to sit on. She didn't want to stand any more...

She found she was lying down and Doc was tying more rope on her harness. She heard the chink of carabiners...

"Lay still and rest," Doc said. "You're tied on to the anchor. Don't worry. I'll get Barth up."

Jessica nodded. "Ropes..." She hoped Doc would remember how to untie all the ropes. She wouldn't be very good with one hand... The clouds felt thicker...

Doc settled himself back against the Tree bark, coiled the slack of the rappel rope out of his way and clipped his body harness to the three-point anchor. He took up the two safety ropes—his and Jessica's—arranged them around his shoulder and hip, then gave the down-running strands three hard pulls; a signal to Arden to begin his climb up.

J'Gween arrived just as Doc thought he felt the first slack in the ropes and began, slowly, pulling them in. The guide climbed across the chequered slope, coming out of the Tree

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

branch and free climbing with his claws hooking onto holds no human hand could use. He appeared to walk sideways across the slope with no more effort than Doc would use on level ground. Doc's anger flared at the ease of this Kyle Murrian skill. The guide could have helped with Jessica, eased her climb and made the whole rescue so...

"Where have you been?" he said, lashing out in a tone that carried all his tired emotions. "We needed you here. Jessica almost fell."

"The Mentsa? Did the *valachi* hurt her?" J'Gween asked looking at the prone girl on the bark ledge. He could see that she hadn't fallen, or that a fall was not what caused Doc's anger.

"*Valachi*?" Doc said, remembering. Jessica had said something about the guide fighting. "God, are they back?" He glanced quickly at Jessica and at the length of safety rope he was handling. They were terribly vulnerable if the *valachi* beasts came at them. Jessica couldn't move fast, if at all.

"No, Tsa. Only one. I have scouted around us and above. There are no signs or sounds of them. The one that the Mentsa met was a lone *valachi* and my huntbow killed it. I sent A'Lween to back-trail the main pack that came at us. If there are any more separated from that pack, he should find traces of them."

"Ho, Doc!" Arden called from the bottom of the slope. He had turned the corner of the bark rectangle. "How's Jessica?"

"Tired," Doc called back. "Come up." He took in more of the rope. Now that he could see Arden, he could control the slack more rapidly. It took some foot and hand work. Barth was swarming up the slope.

"Don't ever leave me like that again," he said as soon as he reached Doc's belay. Doc was still irked at J'Gween and started to snap a sharp answer. However, Arden's grin took the sting out of what he had just said. "Doc, it was rough. I couldn't see a thing you were doing and the suspense was awful."

Doc felt his anger and irritation draining away. No one would let him get mad at them. He wanted a release for his emotions, not just rest. Food and rest would bring his energy back and the irritation would fade away, but he still wanted something more satisfying. This Tree didn't even have a good rock to kick.

"I've never been so alone," Arden said. "Sitting there, staring at two pieces of colored perlon. You know, Doc, this is a very big Tree. It makes some strange and wonderful noises when you just sit and listen. Funny. I could barely hear you calling me, but I could hear this Giant Tree all around me. That's how alone I was, Doc.

"Hey, how's Jessica? She's not hurt badly, is she?"

"No. But now that you're here..." Doc knotted a carabiner clip onto the safety line, casually hooked Arden to the anchor-point, and slid himself free of the belay position. "Let me have your medic-kit and I'll see what I can do to fix her up. You might get some

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

rations organized and let J'Gween untangle the ropes. Do you mind, J'Gween? I've been using about everything we had?"

"I will collect the ropes, Tsa," J'Gween said.

"I will do the rations, Tsa," Arden said, mimicking the Kyle Murrian's style.

"That leaves me. Is anybody going to do me?" Jessica's soft voice had a quaver in it, but Doc heard her. Arden did too. He passed his medic-kit across to Doc with a straight-arm, accurate pass. Doc had the kit before he realized he was reaching for it. "I'm beginning to hurt again, Doc."

Doc peeled the bandage-pac away from her fingers and said; "Open your hand, Jessica. Good. Can you wiggle them?" Doc showed her the motion he wanted.

"Slowly," Jessica said, moving her fingers. "But I can't feel them. And they look..."

"That's the foam. It'll air-dissolve in a minute. Let me redo your wrist." He stripped the bandage and was pleased to see the lack of swelling. The foam had clotted all the scratches around her wrist and the puffiness was gone. There was some bruising, but the narcotic gel was controlling it.

"Nothing serious at all," he told Jessica. "You were lucky to have done that stunt on the Tree. A rock crevice would have skinned you like a rabbit and might have cut your muscles badly. The soft bark, just grabbed you. No worse than a rough fight. I'll put another bandage-pac on," he said. "So you can use your whole arm without bending your hand." He opened the pac and rewrapped her wrist. As he worked he felt Jessica wince and pull away from him a little. She couldn't be feeling anything in her hand and wrist... The gel was a powerful surface narcotic.

"Where else are you hurt?" His voice was low, but intense. He was thinking about broken ribs.

"My shoulder..." she said. "Hey, Doc! What are...!" Doc stifled her exclamations by unsnapping the quick-release buckles on the back straps and body harness across her right shoulder, opening the closures of her anorak so he could pull it and her shirt away from her shoulder.

Jessica's gasp of breath wasn't modesty. All her bare shoulder exposed was the bruise caused when her shoulder socket stopped and held her weight at the end of her slide. Her gasp was caused by Doc's fingers probing to see if the shoulder was dislocated. It wasn't, but the wide bruise on the front was showing a variety of colors and was ringed with yellow under-skin trauma. Her collarbone and the line of her shoulder were almost lost in the swelling.

"This gets a bandage-pac too," he said, opening the protective packet. "And it'll have to be taped in place, as well." He worked skillfully.

"My shoulder's working alright, Doc," Jessica said. "I didn't notice anything on the climb up here. Just a twinge...and when you prodded with your fingers."

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

"Good. Well, this will keep the swelling down." He buttoned her shirt. "Can you get the anorak closed?"

"Huh, huh."

"Good. Then I want you to take this pill. It says: 'For shock, will not cause unconsciousness,' Later you can have an energy-tab for the rest of the climb, if you want."

"Right now I want to sit and watch my fingers wiggle," Jessica said. "I didn't think they were going to, ever."

At this point, A'Lween joined up with the climb again, coming down the Tree, out of the clouds. J'Gween had sent him off on a trailing climb earlier, after the killing of the *valachi,* and so he came straight back to J'Gween. He conferred a minute, then went to one side, away from the Chief Guide and away from the climb party. He began stroking his drumsticks, calling the news he'd brought down to the village.

"Brothers. Brothers. FitzRoi climbs. Hearth Brothers. Beyond the High Islands, he climbs. He climbs. He climbs."

A'Lween's drumming was light and quick compared to J'Gween's, its style alone a signature to tell the ground listeners who was sending the news.

The Chief Guide climbed down beside Arden and explained his partner's curious behavior. "Tsas, Mentsa. The drumsticks tell our village. A'Lween has been back-trailing the *valachi* pack." He motioned around the Tree with one arm. "I sent him back to see if he could find any marks of where the pack contacted the Cat'n FitzRoi."

"Oh, no!" Jessica cried.

"They killed him?" Arden asked.

"No, Tsa. He climbs on the Tree with amazing luck. A'Lween found where they sheltered and where his explosions tore the Tree. He also found where they climbed away this morning."

"Then FitzRoi's still ahead of us," Doc said unnecessarily.

"Yes. And the drums are still beating," J'Gween said. "The Grove Lord still lives. Yes, Tsa. Ca'tn FitzRoi still climbs and we must still climb to meet him."

"What are we going to use to stop him?" Arden said voicing the problem that had kept him awake, before the *valachi* had come, a problem that had been brought home only too realistically by his feeling of impotency as that terrible herd had stalked by. His narco-pistol had been horribly inadequate. "He's armed. Explosive, you said. They make explosive loads for needle-guns. What have we got? Your hunt-bows? This narcotic pistol that Leighton gave me? And Doc's. Anything heavier in your pack. J'Gween?"

"Just your pistols, Tsa Barth, I cannot act against him," J'Gween said, "as long as he threatens the Grove Lord, I can only be your guide. I am sworn to protect the Grove...and the Grove Lord...and I can't be an instrument of its destruction.

"Then how...?"

"Why climb all this way?" Jessica

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

was disgusted. "Didn't any of you stupid men... Nobody brought a gun besides these little toys?" She began working her fingers open-and-closed, pulling her arm up and down, tensing through muscle exercises. She was sitting up now. Lying down was too comfortable.

"They were all the General had," Doc said.

"But the Mountain Marines brought military rapid-fire guns. Didn't either of you ask?"

"Didn't think of it," Arden said.

"You don't ask a Marine for his weapon, Jessica," Doc said. "They didn't bring spares. But I didn't think of it either."

"The Tree will help us, Mentsa," J'Gween said. "We must go on up."

"How far? If he started ahead of us..." Jessica knew she had to get her arm back to the point where she could feel it. Doc and Arden weren't going to set here and rest. They were going after FitzRoi...and she had to go along...

"We will be at the record summit just before the shadows lengthen," J'Gween said.

"Afternoon, uh, huh."

"Probably just before dark. How are we going to tell long shadows from short ones, in this cloud?" Doc wanted to know.

"You will climb out of the cloud in about five more branch rings, Tsa. But we must go now. Are you ready?"

"Ready? Yes." Arden started to tie on a safety rope. "Go on up. We're climbing right away. A'Lween can stay here with Jessica."

"No way!" Jessica said. "I'm climbing too. The best way is to take me in the middle like a student—short ropes—and talk at me."

"What? No. Your hand," Doc said.

"I wouldn't think of it," Arden said.

"Well, think of it!" Jessica snapped back. "Look, we're climbing to get FitzRoi, aren't we? Does that mean we have to do it by the hardest hero route? God, ask J'Gween! There must be fifty ways up from here that...

"Arden Barth, you're a professional at handling tour bunnies. When you climb *Gros madre* on Cindor II, why do you use the South Ascent? Hendrix and Daryll went up the North Side."

"South Ascent is all forty-five degree switchbacks," Arden said. "A drunk could crawl up it. But that doesn't apply, Jessica. This Tree is all vertical face; straight up and down, like the Northside, you mentioned."

"I know, but..." Jessica stood up and grabbed the safety lines that held her to the anchor point. "Oh, isn't there...even this high...a bunny climb...for Jessica?

"Doc, isn't there? I'm so tired. But you can't leave me out at the end."

"No, I don't think I can," Doc said. "Short link, Arden. Keep her between us. You lead to start....And ask J'Gween to find the Mentsa an easier climb. It is his Tree; he's the guide."

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

Arden said; "Mad. Mad. We'll never catch FitzRoi now." But he was wearing that wide grin and measuring out the length of safety rope for her harness. "All right?" he asked.

Jessica grinned back and balanced herself against the Tree. "I'm still anchored, but I feel ready to go," she said. She picked up more enthusiasm from Arden's answering grin. Arden had changed. He had lost all the anger and irritation that he'd shown after his fall. This grin meant that he was ready and willing to help her climb. Arden had changed... Some time during the night...the violence of the *valachi*...the listening in the dark...just the waiting, alone with the Tree... Arden had come to realize that the Tree was a place to climb, not an evil thing to fight. He'd stopped his bossy insistance on telling everybody what to do and he merely began organizing the ropes and getting in position when Doc suggested that he start off as leader. For him that was calm behavior.

J'Gween indicated a direction and they started up. Doc left the bark rectangle last. He was watching Jessica carefully but she seemed to be alright. Favoring her right arm, but that was natural. He collected the anchor loops and climbed close behind her.

After a half hour on the climb, Jessica was very glad to have Arden up above her in the lead position, helping her as he climbed. Arden's profession as a climb instructor had geared him to helping his women climbers and he did it with an unconscious ease and skill. Jessica was a good enough climber to recognize what he was doing, but the condition of her hand and arm made her glad enough of his care.

They were climbing at an altitude now that took away their strength very quickly. The strain of Jessica's rescue was telling on all of them before they'd cleared the *High Islands.* Doc and Jessica were climbing on energy-tabs. Beyond the *High Islands* they climbed into an area marked, *Brick Wall,* on the climb map. It was another section of short, near-horizontal pitches and vertical chimneys. An area that was the best J'Gween could do in selecting a route that let Jessica climb with a minimum use of her hands. However, the continuous changing from one style of climbing to another came in short intervals, none of which gave the climbers time to set any sort of rhythm to their climbing and it was proving to be very tiring.

True to J'Gween's prediction, they climbed out of the cloud eventually and for the first time it was really apparent that they were climbing on the trunk of a Tree. The sun filtered through the Tree above them in flickering patterns of dark and light. The branch structure and needle-leaf formations were spread around the climbers, patterning the sky, as they looked outward and upward. The grey, colorless cloud gave way to a profusion of browns and yellows, and the green of the living Tree. The branches were growing smaller now, as the party climbed higher, but were still four to five meters across. They were

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

closer together too, and Arden, who had kept the lead up to this point, had trouble seeing far ahead. There was always a bulging overhang from one of the branches in the way.

Then, climbing around the curve of a branch, Arden found the guide waiting on top of the branch, motioning him onto the surface. J'Gween helped him set up the belay and guided Jessica up onto the level surface, then he signed Arden to continue the belay. Arden agreed, taking up the slack on Doc's rope and bringing him on up. J'Gween's action prevented Arden and Doc from going on with the climb and brought all three of the climbers together.

None of them was doing any talking. The altitude up here was high enough now, so that climbing took most of their effort. Jessica was working her arm and moving her fingers to ease the muscles and prevent any cramping. She had no thought of conversation until her breathing caught up. Arden had his eyes closed, resting, so it was Doc who had the time to notice that this stopping place was more than just another rest stop.

The branches here were all rooted in a trunk wall that had been blasted and broken by some ancient tragedy. Lightening or storm wind had broken the top of the Kyle Murrian Tree, causing ruin that would have killed an ordinary tree. But the Giant Tree had survived, and while this was definitely the final ring of strong horizontal branches, there was new vertical growth rising up from points all around the ring. Spires and shoots of green, needle-leaf growth that turned the broken tree top into a miniature forest grove, a small valley of upward reaching branches and leaves. In the center...in the center a single trunklet, larger than the rest, grew straight and proud. Branchless for ten meters, it then grew a long cone of new branch rings and fluttering, swaying leaf-needles. It was as if a whole new tree was growing out of the center of a forest glade, here, forty-two hundred meters in the air, atop the Giant Tree of *Kyle Murre*.

On a rock climb—on a mountain—you pulled yourself over the final ledge, climbed up the final ridge-spine, and suddenly there was nothing ahead or above; the whole mountain was below you when you reached the top. Here on the Tree, Doc realized, you climbed into this peaceful glade, surrounded by leafy, waving branchlets. At this point he saw J'Gween, out in the glade, standing by a metal pylon and knew for certain that they were at the record summit—the top of the Tree.

"Jessica," he called, softly. "Ho, Arden. We're here. Take a look."

They had climbed the Giant Tree of *Kyle Murre*.

Doc and Jessica made the camp slowly and with a sense of anticlimax. Jessica was using her right hand tenderly. Now that the adrenalin of climbing was draining from her she was beginning to feel a dull pain in her wrist. She tried to ignore it because she didn't want to worry Doc anymore.

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

There wasn't going to be anymore climbing for a while; rest would do a lot to get her arm back in shape.

Arden and J'Gween went off to circle the edge of the Tree top and to see if they could find any sign of FitzRoi, but they went out with the same sense of lack of climax. They'd climbed the entire height of the Tree expecting to find FitzRoi at the end, not really knowing what they could do about his bomb trigger when they found him, but expecting to meet him.

And FitzRoi wasn't here.

17

FitzRoi was climbing painfully slowly. He'd spent the night in military rest, but the necessity of guarding H'Reeh and being watchful for further attacks by night-hunting tree-animals had given him little sleep. The strain was telling on his muscles now. He moved slowly from one hold to another, taking long seconds to make sure of each foothold, climbing in very short pitches, so that he was always sure of his balance. He was tired, almost to his limit, and he knew any emergency, any forced demand on his muscles would carry him to the point where he would have to stop. This slow steady pace, however . . . He might be able to keep that up for a long time. A man never knew the limits of his endurance until he forced himself to reach them. FitzRoi had tested his own climb-limits enough times to know what to expect on a mountain, or a glacier, but this endless vertical climbing . . . He didn't know his limit for this kind of climbing; wouldn't know it until he failed and fell or, exceeding the barrier of his exhaustion, climbed to the top of the Tree.

Step . . . up. Reach . . . hand, pull . . . Step . . . FitzRoi climbed higher.

Savagely he jerked on the rope connecting him to H'Reeh and when the guide turned his head, waved wearily to the right. His vertical compass showed that the guide was working away from the sun again; away from FtizRoi's straight up climb-plan. They were climbing through the *Fishscale* section of the Tree's upper bark and had to follow the turning channels of the crevices between the bark islands. FitzRoi had tried climbing across the face of one of the blocks, forcing H'Reeh to string a climb-line up the hexagon. But the wind twisted him on the rope, make it a struggle to find and keep footholds, tore the air from his lungs, destroying his timed breathing and forcing him to fight for oxygen. At the top of only one fishscale, FitzRoi was forced to halt and rest while his respiration came back to normal. After that he was willing to follow the guide's lead in the channels between the hexagons, turning and twisting as they climbed up and over, and up and across. His compass kept him in control of the guide's course, but the distance he was climbing was longer than his plans had called for. And the increased climbing time was beginning to tell in his leg and arm muscles, slowing him.

It was dulling his perceptions too. He no longer picked out his route ten

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

or twelve meters ahead. More and more, he found that he was climbing from one hold to the next with no clear idea of where that next hold would be. Many times now, the guide's climb-rope had jerked into tension, dragging against the Captain's weight as H'Reeh climbed up beyond the limit of his tether before FitzRoi was ready to go up behind him.

FitzRoi was forced to let this condition go on. The vertical compass helped him keep on the right course, but there was no way that he could keep the guide from climbing faster. FitzRoi wasn't even sure his lagging muscles had the strength left to catch the guide. Even if getting close enough to discipline him wasn't a very good idea. He didn't dare close in and try to knock some sense into the stolid guide. In his present physical condition FitzRoi didn't dare get close to H'Reeh's deadly claws and he knew it. But that creepy squirrel-head needed a good beating. Two hours on the punishment stocks with a good discipline sergeant would make a hell of a better guide out of him.

FitzRoi reached high to put a nut-loop in a crack as support for his next move. The crack he was using had chips and wear marks on it. The grain and texture of the bark were clear in every detail to his fatigue magnified sight. He set the nut. At least he had enough skill left to follow the guide's climb pattern. He'd picked the same spot for his support. Where next? He peered along the traverse and spotted another bruised place in the bark, ahead and to the right—another nut-loop location.

But wait . . . He shook his head doggedly. H'Reeh's rope had tugged at him again. And the rope led off to the left . . . up to the left.

FitzRoi grabbed the climb rope and jerked it to stop the guide. There wasn't any strength in his tug, or it would have pulled H'Reeh off the Tree, but it did slack the rope, give him time to organize his mind to the new direction. New direction . . . He fumbled his compass out, checked. *Hah! The damn guide was going right, at least. Must have started off the wrong way and switched back. Smart. I've got him tamed.*

FitzRoi switched his balance and stepped upward, following the rope. He jerked weakly, tiredly, at the climb-rope, finally sawed frantically at his safety line, swearing at the guide, the Tree, the nut . . . Aargh! He freed the loop, tearing a chunk of bark away.

FitzRoi climbed.

The surge of strength flowing behind his anger, carried him up out of the *Fishscale* area and into a series of long, slanting, zig-zag ascents. They led steadily upward, but not directly. And they were the only route. FitzRoi didn't need a guide to tell him that. Except for the crevice-cracks, the Tree-bark was smooth, unclimbable. He could have driven pitons and climbed on their support, but he didn't have any pitons. He'd known about the TSC rules—the native taboo—and he'd used the space

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

in his climb-packs for other things... No pitons, so he'd have to follow the guide again.

But H'Reeh wasn't climbing. Just standing against the first ascent, resting on his safety line. The climb rope was slack between them.

"Go on," FitzRoi said, the words coming out mushily in his tiredness. "Climb it!"

"I can't, Ca'tn," the guide said. "It doesn't go any further. We have to go back down."

"The hell you say! Not for you or anybody. Get on up!" FitzRoi pulled his pistol, wavering it at the guide. His arm muscles were strain-tired and he wasn't sure he could control his shot. But the threat was enough, the guide turned and climbed up and around the corner of the trench.

FitzRoi slung the pistol around his neck and scrabbled after him. It was a measure of his tiredness that he actually climbed around the corner before the idea struck him. H'Reeh, out of sight for minutes, might be waiting to ambush him. The realization flared through his numbed perceptions. He grabbed for balance on the climb-loop that he'd just planted and groped wildly for his pistol. Then he stopped, did nothing at all, and stared up the broken-bark slot at where the guide hung waiting for him.

The end of the trench was blocked by a jack-straw tumble of broken splintered pieces that were small by the scale he'd come to expect of the Tree, barely the size of a man's leg, and there appeared to be lots of space between the foremost ones. But behind, or above, them the tangle grew thicker. Wind-blown and broken, the bits had fallen into the nestlike grid and jammed themselves tight. The way was indeed blocked.

FitzRoi moved finally, released his gun, to dangle on its sling, began to set loops for his safety harness anchor so that he could lean against the cleft wall and rest. His chest was heaving with the effort of getting enough air for his tired lungs. Rest! That's all he could do now. Rest and keep an eye on the guide leaning in the shadow on the other side of the slot.

Shadow? The shadow was long enough to cover half the trench.

"Night," he gasped. "How long 'til dark? How long?"

"Just an hour, Tsa," the guide answered. "A little more. We should start down, now."

"Down? Huh, ya. Down to that other place where you started to go off to the side. Down there, huh? Where does that go? Back up?"

"I did not go to one side, Tsa. But there is another way to the top. We must get to it while the light holds."

"You didn't..." In his tired condition, FitzRoi took everything that was said literally. He wasn't thinking clearly enough to suspect H'Reeh of lying. As a matter of fact, those torn places on the Tree—further down below them—had brought back a deeper memory, triggered implanted training that was deeper than his mountain climbing skill, more deeply

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

concerned with his own survival.

He was seeing a trail along the ground on a jungle planet, light years away in distance, but only a memory away in time. He was seeing turned dirt clods and broken grass stems crossing the trail at the same angle as those bruised bark signs. On Ontar III he'd been leading a police patrol; the cross trail they'd cut had led to a two-day fire fight—twelve prisoners... fifteen casualties. On *Kyle Murre*...

There was another climb party on the Tree. He'd crossed their trail and hadn't even recognized it at the time.

"H'Reeh! How far to the top?"

"Right above us, Ca'tn. See the size of the broken wood. We can go down and back up before dark."

"That close, huh?" FitzRoi glanced up, then around at the sides of the small canyon. He was thinking with a whole new set of instincts, now. He was converting the record summit into a military crest, the tangle-scramble into antiassault barriers and the smooth bark tops of the cleft into a defense perimeter. "Then they are probably ahead of me..." he said. "On the high ground.

"Get out your hammock!" he called to H'Reeh. "We're staying here 'til dawn."

"Here, Ca'tn? There is no level... We can camp on the Tree summit, Ca'tn."

"So can anybody that's chasing me. They can have it all night long. I'll get it...take it...back, tomorrow. Get out that hammock! Set the loops and swing it! Work fast, Fuzz-face. I want you in that sleep-sack so I can tie you up for the night. And I want it, now!" He pulled the pistol up to his hand, enforcing his order with a threat only. He couldn't risk a shot this close to an enemy patrol, but the guide didn't know that.

H'Reeh shrugged out his pack and began to pull out the sleeping hammock.

FitzRoi looked upward toward the summit of the Tree, unseen above him and laughed. Tired as he was, he laughed. He'd climbed the Tree. His solo climb would be over by the next morning when he reached the record pylon. The TSC hadn't been able to stop him.

As for the people waiting for him... He laughed again. People had waited in ambush for him before. He'd take care of that too—in the morning.

18

The tree top camp was quiet. Doc and Jessica sat on one side of the heater and Arden on the other. A little way off the two guides were facing the central spire and stroking a soft prayer rhythm on their drum-sticks. The sun had set below the cloud bank, below the horizon by Arden's climb-watch, and the sky was beginning to darken. The Tree-top glade was already in deep shadow and the space heater was at full glow to give them light and warmth.

"The wind's gone," Jessica said, cocking her head to listen for the missing rustle of needle-leaves. "Yet I can't hear the drumming any more. I

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

mean, those drums down below," she smiled in the darkness. "Maybe J'Gween's drowning them out, but shouldn't they be louder now that there's no wind?"

"Evidently not. Still air like this right after sunset is a temperature situation... The temperature range may not be right for transmitting the sound up to us... Or maybe it's the wind." Doc was not really trying to present a line of reasoning, just thinking aloud. "The wind should start up in another hour and then we might get the drums in loudly enough to hear them again. *They* can still hear them, however." He pointed to the two guides.

"Huh? How so?" Arden asked. "Oh, sure you mean they probably hear better than we do, huh?"

"A great deal better on some frequencies, I expect," Doc said. "Look at those ears. And besides I've found that most people who live in the open—desert, forest, up in the mountains—hear one hell of a lot better than we do. An air-conditioned city is too noisy to develop good hearing.

"Arden, you've climbed Taragora, haven't you?"

"Thirty-six Ophiuchi Two?" Arden sang the pronunciation. "Sure, once you learn to say the name of the planet, you never forget it... Or their mountains, either."

"Were you ever in on one of their whistle-moots at Tanagora?"

"No. Heard about them, but I never got invited. I've seen the trek-leaders talk to each other on the mountains, though and, of course, in the ice caves."

"The Taragonnese have a well developed whistle telegraph system, Jessica," Doc explained. "They talk to each other across valleys, up mountains, and from one valley to the next, by passing incredibly complex whistle messages from man to man until the message reaches its destination. Their hearing can separate impossible tonal ranges over distances of ten to fifteen kilometers.

"The whistle-moot I mentioned is a law-giving-cum-justice meeting of all the mountain leaders. It meets every three years usually and the whole thing is held in whistle-talk; complaints, arguments, judgments and laws-passed-in-council. All as public as a two-hundred watt PA system... And quite marvelous musically when it isn't just noise to an uneducated ear. Heard one once. I've got a lawyer friend I've always meant to take back there... He thinks he can talk to a jury...

"Ah...er. What I meant about the drums...beside the Kyle Murrian hearing...was that the drums will beat as long as the tree that FitzRoi mined is all right. If he destroys it, they'll stop. Those two out there don't act like the drums have stopped so it's my guess that they can still hear them."

"Where do you think FitzRoi is?" Jessica asked, squirming into her sleep sack with a shiver.

"Still on the tree-side, below us, somewhere. Probably camped on a

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

branch for the night. J'Gween says that there are three main places where the climb trails come up here. In the morning we'll set up a watch on each one. Meanwhile, we ought to get some sleep." Arden was still organizing the climb.

"Sleep? Yes, I suppose so," Jessica leaned back. "I'm tired, but not at all sleepy. However, it is night isn't it. Look the sky's gone all dark." She was quiet for a moment, then, her voice choked with emotion, she said, "Oh, look! The stars. Arden! Doc!"

Both men looked up at the sky. Arden said, "Would you look at that!" Doc reached across and turned down the glow of the heater.

Kyle Murre was a planet of a sun located deep in the center portion of its galaxy, but very near an astrophenomenon known as a rift. The result was that part of *Kyle Murre's* sky was dark, starless, the other part was blazing with a sweeping, feather fan of the galaxy's rift arm which curved across the sky from horizon to zenith. The stars were so closely spaced that the eve seemed to blend them together into glows and stringing bands of radiance. As a viewer's head moved, these patterns seemed to shift, the eye moved on to another pattern, the mind formed another grouping of radiances.

Throughout the night this arcing arm of stars would waver and shift. The planet's rotation, the change of visual angle, forever bringing new stars into a different patterning, making an ever-changing display of incredible luminous beauty.

"That heavy cloud cover," Arden said at last. "They can't see this from the ground."

"Oh, there must be lots of places on the planet where they can see the sky," Doc said. "The cloud cover is only coastal—over the forests."

"*We* can see the galaxy structure from space, too," Jessica said. "But it doesn't look like this. I've never seen it so beautiful. No one at the Climb Club said anything about this. I wonder why?"

"They probably want to reserve it as a surprise for anybody who climbs this high," Arden said. "If you aren't dedicated enough to climb to the summit, you won't ever know what the night really looks like on *Kyle Murre*."

"I can't get over it. The sky's so beautiful." Jessica was still looking at the milky-white night. "I don't think I've ever seen a starfield—anywhere—like this."

"You've never been on top of a tree with two men before," Arden said lightly.

"I think that's it," Jessica's tone was serious. "When you think of the climbing we did to get here. The fact that no one else in all the world—no one else on any world, anywhere—is seeing exactly this piece of night sky..."

"Perhaps that's so," Doc said. "The view from the top of any mountain is always a little clearer, a little cleaner, even when you have to look at it through an oxymask. I used to think

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

it was just because I was all alone and could see so far. But there is more to it than that. It's what you have to do to get there that makes anything worthwhile, I think. Climbing takes the best you have in every way. What you experience at the top, satisfaction, emotion, relief.... The end result of all that tremendous effort ought to be capped with a visual experience that's absolutely unique. It has to be that way, doesn't it?"

"Well, this one certainly is," Arden said. "I don't think I'll ever forget it. You can't see the ground or the horizon, or anything but those magnificent stars. Nobody will ever believe anything about this...if I tried to tell them."

"No, that's the best part," Jessica said. "I'll be able to keep it all to myself...to remember whenever I want to..." Her voice lapsed into quiet, with a little sigh.

The two men were silent too, looking up at the stellar display. After a time the wind came back; began rustling the needle-leaves around them and changing the sound of J'Gween's slow drumstick patterns.

In awhile they slept.

19

A snapping roar of shots woke everybody, rolled Arden out of his bedding in a violent dodge as stinging splinters showered against his head and shoulders. He came up in a standing crouch, fumbling the dart pistol out of his pocket and searching the Tree surface wildly.

The morning wind was whipping the Tree branches and tossing the needle-leaves with darting gusts, making it impossible to see any movement in the hiding foliage.

Another pattern of shots sprayed across the middle of the camp, tearing the space heater to bits.

"FREEZE!" The wind hid the direction of the voice. "Everybody stay in one place! Just don't move!"

"FitzRoi!" Doc said. They'd all recognized the voice.

"He did get here before us," Jessica said.

"No, Lady Van Horn. We made it at the same time. But that doesn't matter. Not at all. I made the climb solo and I will be the first to record such a climb. I told you I would. It doesn't matter when you arrived.

"Now, you two get out of those sacks... Slowly!"

"Brothers, Hearth Brothers. He is here. At the top. Top. Top. FitzRoi. FitzRoi. Guard us!"

J'Gween's drum-sticks rapped out a loud rattle of sound, sharp and harsh in the wind. The sound half-turned FitzRoi, but he was too far away for anyone to take advantage of his surprise.

"Come on in!" This command was to the two guides, emphasized by another burst of fire, this time splintering the branch behind where the natives stood.

Jessica ducked away, her scream lost in the noise. She scrambled quickly to her feet, moving closer to Doc and stood shivering in the wind. Doc scooped up both their jackets as he

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

came across the ruined center of the camp. He handed her anorak to the girl and turned as FitzRoi came out of concealment.

"That's better," the Captain said, waving them together with his pistol barrel. "Move right in together, where we can talk without anybody getting foolishly pushed off a branch."

"Quick!" He emphasized his command to the guides with a jerk of the needle-pistol. "And let's be careful of those hunt-bows. You! How do they call you, monkey? J'Gween? Put the bows down real carefully, hear. And get rid of those sticks. DO IT!"

The two guides obeyed him, taking off their drum-sticks and laying them down on the Tree. J'Gween had said he would not act against the Ca'tn as long as the threat to the Grove Tree still existed. The drums far below on the ground still pulsed in his ear tendrils, telling him that the Grove Lord was not yet safe—still threatened—so he obeyed.

"Now, Barth, you're next. Decide what you want to do with that gun. Use it or drop it! I'm waiting. Put it down and back away."

"Do it, Arden," Doc said, quietly. "Not much else you can do. You can't fight with narco-darts against explosive pellets." He took out his pistol and threw it down.

Barth dropped his dart pistol, reluctantly, straightened up out of his crouch and moved over beside Jessica.

"Well now, let's see what you brought me," FitzRoi said, coming down into the camp and squatting by their packs. "Looks like enough food for the trip back down anyway. And those two pistols...hummm." He picked up Arden's pistol. "Sleep darts, and a full automatic clip, too. Not normal climb equipment, is it? You were planning this for me, I take it? Let's see if it works!" He lifted the pistol and sprayed the dart stream across the group.

Jessica screamed.

Arden dived forward, clutching at FitzRoi's grinning face.

The Captain rose from his crouch and kicked Arden cruelly in the chest.

Arden felt the kick. It exploded a flare of light behind his eyes, but brought no other pain. The quick acting narcotic darts were already dropping him into unconsciousness as he fell heavily to the Tree-bark.

He struggled back to consciousness to discover that he was tied, hand and foot, and propped up on his pack so that he could see FitzRoi standing by the record pylon.

"Arden. Arden, are you all right?" Jessica called. She was nearby, also tied. Arden grunted. His chest hurt too much to talk. He turned his head and found that FitzRoi had arranged Doc and the two guides—no, there were three natives—all in a row, facing the metal climb pylon. FitzRoi had used the climb rope to bundle everybody, tying the Kyle Murrian's hands and feet in bulky bags made out of the pack rucksacks so as to blunt their claws. He'd done a good job, despite the holiday-package look of the col-

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

ored rope on the climb-clothes.

"Good. You're all awake," FitzRoi said. "I've been waiting for you, Arden. I need witness to my climb certificate, so keep your eyes open and watch." He pulled the blue climb book out of his pocket and placed the record sheet across the code numbers on the plate at the top of the pylon, rubbing his thumb along the surface of the paper to impress the numbers in the sensitive chemical area. This code number embossed on his climb book was considered legal proof that he had made the climb. The procedure was familiar to all of them. Doc carried the climb book for their party, and they'd all recorded similar climbs from the record plates on other mountains—Everest, Tell 905, Emphyron . . .

"There! I have it! The first solo climb of the Tree!" FitzRoi returned, tucking the climb book back in his pocket. "And properly witnessed, too."

"The record will never stand," Arden said. "Because of the way you got it."

"I got it by solo-climbing the Tree. That's all the record books will care about."

"You don't care what we say?"

"Arden!" Jessica gasped. FitzRoi might not have planned on eliminating witnesses, but there was no reason to taunt him with the idea.

"No, I don't. The fact that we were together will prove that I made the climb. As for our guides . . ." He came closer and bent over J'Gween. His hand dipped into another pocket and came out with the flat trigger box. "I told you what would happen if you followed me, didn't I? I told all you Fuzz-faces to stay away."

"FitzRoi! He was guiding us on a climb," Doc spoke up quickly. "We were trying to beat you to the top. He was just guiding us, man!"

"A race? Carrying a narco-pistol? I don't think so, Doctor. I think this stinky fuzz-tail picked on somebody to do his dirty work, thinking I wouldn't push the button if you people came after me.

"Well, you guessed wrong. Tell me, ape-face, what will happen if I push this button?" He poised his thumb. "Don't play dumb. Answer me! Do you know?"

"The drum-branches will sound our grief," J'Gween said, and followed the words by a phrase in his own language.

"Aactcha! Brothers, he cannot hear the drums. Do not tell him

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

of their magic. Let the prayer drums work against his strength. The-Tree-wills-it."

"If that means that you'll get a signal from the ground..." FitzRoi whirled to point the box at Doc. "Can they do that, Barr? Beat drums that we can hear up here?"

"Get your thumb off that trigger," Doc shouted, then collecting himself, he went on pedantically. "Hollow wooden drums can be heard for eighty-five kilometers or more."

"So, you both know about the detonator, do you." FitzRoi sat back on his heels and laughed. "Well, that means I *have* to press this button, doesn't it?

"You understand, Chief Guide?" His voice rose to a shout and he laughed wildly. "I have to press this little button now."

J'Gween began a slow dirgelike chant. Not a funeral sound—it had triumphant tunes to it—but a slow, pulsing rhythm.

"I've never seen it to fail," FitzRoi's contempt was apparent on his face. "Kick a native and he starts whining a crying song."

"He is recounting the wonder years when his people watched the Grove Tree grow out of the sacred earth," Doc said, paraphrasing the song. DeCoverly had transcribed and translated this chant in his book. "Have you any idea how long that one tribe has been guarding that one tree? These trees grow very slowly. Those names he's reciting are probably generations of guardians."

"Oh, no!" Jessica absorbed the point quickly. "They'll have to start all over again—face all those years ahead. All that time. FitzRoi... You can't..."

"Oh ho, the woman speaks," FitzRoi said. He walked over to kneel beside Jessica. "The eternal female. What are you about to do, Lady Van Horn? Offer me your lovely white body, here in this woodsy glade, if I will let the little bitty tree go safe. Well, now. Climbing is an intensely stimulating sexual experience. I always want a woman when I come down off a mountain. Why not on top? It would be diverting. Maybe you *could* convince me. Want to try?"

Jessica, half propped against a bark-fold, couldn't move away from him; indeed, after a second, she didn't try. She just bent her head and looked down the length of her body, bundled in anorak, climbpants, laced shoes, the loops of colored rope, then she looked back up at his face and laughed.

FitzRoi flushed, raised one hand to hit her—then controlled himself and said, coldly, "You are right. You aren't exactly a seductive sex object, are you. I could peel you out of that with with a sharp knife, though... It might be fun..." He stood up abruptly. "Well, I haven't got the time," he said and laughed. "Maybe later, huh?"

"No, wait!" Jessica cried, thinking he was going to push the trigger. "Wait!"

"Oh, I am, Lady Van Horn. I'm going to wait. And so are you—all of

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

you." He tucked the trigger box back in his jacket. "I'd blow that tree up in a minute...but first I've got some other things to do. You see I haven't finished climbing this *Kyle Murre* Tree." He whirled and flipped his right arm up, pointing at the trunk of the central treelet, the towering regrowth spiring up out of the center of the broken tree top. "I've never stopped short of the top of a climb yet—I'm going on to the top of this one."

J'Gween broke off his chant and yelled, "The New Tree is holy!" The words were a raw burst of sound, almost seeming to be part of his chant.

"Holy? Everything you fuzz-tails touch is holy. The hell with it! How are you going to stop me, boy? And you know what? When I get up there ... That's where I'll be when I push the detonator. Up there! You just lie down here and listen for your drums to tell you when I do it. Just listen. Hear?"

He turned away and walked over by the pylon where he'd stored his pack; pulled it out from its hiding place.

"How can he climb that trunk?" Arden said, his professional interest taking hold, despite the situation they were in. "There's no bark on it. It's smooth. No handholds or cracks for nut-loops..." He broke off.

"That's how," Doc cut in.

FitzRoi had opened a long pocket in the side of his pack and taken out some metallic bars. He bent and began strapping them to his legs and boots.

"Climbing irons," Arden said. He could see the dull gleam of heavy triangular spurs, pointing inward from FitzRoi's boots. "That'll do it all right. Bet the TSC doesn't know about those—anymore than they knew about the explosives, or his pistol."

"They're illegal," Doc said. "Prohibited, or worse. Look at J'Gween."

The guide had taken one look at the climb-irons, divined instantly what they were for, though he'd probably never seen a set before, and had begun fighting against his ropes. His mouth was open, his teeth bared, and his breath panted in hysterical effort as he jerked and tore at the ropes. His body arched and threshed against the Tree surface with his effort. The other two guides began a low, gutteral song, timing it to his efforts. There was nothing pleasant or triumphant in this chant and Doc didn't have a translation. The hate they were projecting was clear, beyond the need of translation.

FitzRoi ignored their noise. When he was ready, he slung his pistol and walked over to the base of the central spire. Throwing a bight of rope around the trunk as a safety belt, he lifted his right foot and slammed it sideways into the trunk, sinking the spur deep into the wood. His left followed, and he began to climb, step by step, up the trunk, leaving little tears of raw, new wood as he went.

At the first thrust of the spur, J'Gween screamed—a rising animal sound—and lapsed into silence. His muscles strained and expanded against the ropes with such massive

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

hysterical force that his body was rigidly still, unmoving in the strain.

The two other guides echoed his cry, then they, too, were silent.

The, *thunk, thunk thunk,* of FitzRoi's climbing was loud, the only sound in the shaded stillness of the tree top.

"Doc, talk to him," Jessica sobbed. "Make him stop. He'll hurt himself." She was talking about the straining J'Gween.

"Doubt if I could reach him," Doc said. "Look at his face. FitzRoi's trying to destroy his world...and putting spurs into that new tree... This Tree is like a God to them..." The anthropologist section of his mind caught at a thought. "Good God, do you suppose the Kyle Murrian's feel the same sort of guardian duty/religious watchmanship to *this* Giant! Of course they do! And if it died, the duty burden to grow another would be staggering. Not just generations of one tribe... Hell, this Tree has been growing for geological ages. A million years would be nothing... No wonder he went mad."

"FitzRoi can't kill this giant just by climbing the top spire," Arden scoffed. "Those spur scars will heal over."

"J'Gween doesn't know that," Doc said. "He knows that the Captain can destroy his sacred Grove Tree, with the explosives, and all along he's been saying that the Tree would help us stop FitzRoi. Now, he's had to watch FitzRoi conquer the Tree. The sight of that might have driven him over the edge at last.

"Then too, he wouldn't let us use pitons to climb, remember. There must be a taboo against metal being driven into the Tree. That must have some basis to fact, even though the fact is probably lost. J'Gween must figure that he's the last possible man to stop FitzRoi... Just him, alone...

"Anyway, it's pretty obvious that he hasn't given up fighting FitzRoi. Look at him... That really worries me."

"Huh?"

"If he ever does get loose in that berserk fit, he may not be able to tell the difference between FitzRoi and us. I'd like to be somewhere else until he calms down. Any chance that you can get loose?"

"Not a hope," Arden said. "He tied things too tight. Jessica, did he..."

"Not a hope," she repeated. "I was trying to get him to try. He would have had to undo a lot of ropes to get any clothes off."

"Forget it. That's too dangerous a method, with that nut."

"Dangerous? Compared to lying still, waiting to get shot?" Jessica laughed hoarsely. "I haven't been raped in a long time, buddy boy. I don't think your Captain's big enough to give me any trouble. The problem is that he was right. These climb clothes are somewhat less than seductive. I'm..." She screamed.

There had been a sharp, high-pitched crack. J'Gween jerked half-over in reaction, then sat up and was

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

tearing the binding cloth away from his hands.

"He did it!" Doc said. "By God, he did it!"

"I don't believe it." Arden was amazed. "Those ropes have a breaking strain of fifteen thousand psi." He strained at his own ropes. "J'Gween, cut us loose, man!"

The guide's claws made short, ripping work of the ropes binding his feet and he stood up, staggering and weaving, as his strained muscles fought to hold his weight. *A'L ween and H'Reeh raised their voices, chanting in triumph, urging him on.*

Two Mountain Marines came into the glade. They were moving fast in reaction to Jessica's scream and the Kyle Murrian chanting. They came in fast, spread apart and rolled to cover. Their weapons were aimed at J'Gween. They hadn't fired because neither one of them could see the three climbers—or FitzRoi. The two Marines weren't worried about the single native, but FitzRoi was armed.

"Don't shoot! He's our guide!" Doc yelled. He'd heard the rattle of the cocking bolts on the Marine's rapid firers.

"Doctor Barr, where is FitzRoi?" a call came from the perimeter branches of the glade, the two Marines were still and invisible.

"He went up the new tree growth," Doc answered. The voice was Colonel Estaban's. The Mountain Marines had arrived in force. "Watch J'Gween."

Ignoring the Marines, Arden and the rest of the party, J'Gween stalked across the glade headed for the trunk of the new tree.

20

At the base of the treelet, J'Gween poised to climb, following FitzRoi, then he stopped, frozen in position for a moment. In a spasmodic movement, he threw his arms wide and shouted a phrase. The other guides stopped their song in mid-word.

"'The Tree Triumphant!'" Doc translated the cry softly. "I know that one. But I don't know the song."

J'Gween was returning, walking slowly. When he drew near, they could see all of the madness had faded from his eyes. They were the soft, deep color that the climbers had always known, calm and knowledgeable. He bent over Arden and cut loose the ropes with his claws.

Without a sound, one of the Marines was beside Arden with the muzzle of his rapid firer centimeters from J'Gween's head. The Marine's eyes flicked to the ropes, saw what J'Gween had done to free Arden, saw the condition of the guide's wrists and forearms and swore softly. The gun became another piece of equipment and his knife appeared to help Arden with the rope on his legs.

"Will you untie the others, Tsa?" J'Gween asked the Marine in his usual tone. "My hands will not work on knots as yet."

"Good God, I should think not!" Arden said, working on his legs. "Your skin's all torn up. Can we do anything for the bleeding? Our first

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

aid kit? The medicines?" He didn't know whether the aid kit had stuff for Kyle Murrians. The point had never come up.

"I will not bleed, Tsa. That is in control, but the muscles in my hands will not yet work on such small things as ropes."

Arden was working on Jessica. His fingers were stiffened enough to find the knots troublesome, but finally the Marine Corporal had freed Doc and come over with his knife. His partner had worked the ropes and bags off of the two guides, A'Lween and H'Reeh. The Corporal had also made whistle signal to call in Colonel Estaban from the perimeter.

The untying business didn't take long, but Jessica couldn't stand the waiting. "J'Gween," She asked. "What about FitzRoi? Why did you stop?"

Colonel Estaban and an armed Kyle Murrian in a uniform kilt came into the glade. Jessica reacted to the Mountain Marine Colonel with a sudden dread, jammed her fingers against her mouth in horror. "Oh, J'Gween. Did the drums stop? Did he push the trigger button?"

"No, Mentsa. The drums are still beating.They have worked their power wonderfully. I think that there is no longer a need for the drumming. But I cannot use my own drum-sticks to tell the village." He held out his hurt hands, helplessly.

"Huh?" Arden heard this last. "No need for drumming? What happened, J'Gween? Did he drop the detonator in his hurry? You have to be careful of that, you know. As long as the pilot light is on, he hasn't fired it and it's still dangerous to pick up."

"You'd better let us handle the detonator," Colonel Estaban said. "Show me where it fell. Martin!"

The Marine Corporal moved over toward J'Gween.

"Wait, Tsarias. He didn't leave the trigger behind." J'Gween collected them all together with a sweeping wave of his arm, motioning them toward the tree spire."That's not what I wanted to drum to the village. Look! Come with me. I will show you."

The guide walked over to the spire. There was a new dignity to his walk that they had never seen before. He wasn't the chief guide with a climb party any more. He walked now as the Grove Guardian and he was approaching the heart spire of his holy Tree. The strength of his belief wrapped him in a grace and power that changed his whole being.

He paused at the base of the central spire and pointed upward. His voice rang through the high air of the tree top.

"The Tree of *Kyle Murre* has fought its own battle. No man may challenge the Tree as Ca'tn FitzRoi did. No man!"

Corporal Martin said, "Look at that!" He was too amazed to swear.

The clear bark of the trunk was stained by a trail of blood. It flowed downward from the green concealment of the small branch rings above them.

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

Doc drew in his breath. Jessica gasped.

Arden said, "J'Gween, what...? Something up there? Like those *valachi?*"

"No, Mentsa. There is only the living Tree above us. The Holy Tree. The Conqueror Tree."

"FitzRoi? Somebody has to help him," Jessica said. "He's hurt."

"No need," Doc said quietly, supporting Jessica who had leaned against him. "That blood is flowing a long way."

"Hoy, you're right!" Corporal Martin stared up the height of the tree growth. "There's enough blood coming down that trunk to drain a man."

Now Arden began to swear.

Jessica looked from one to the other, trying to take in the idea that FitzRoi was dead. "Well aren't you going to help him? Somebody should go up," she said, finally.

"We can't climb that trunk," Doc answered. "We haven't any equipment for it. And I doubt whether J'Gween would let us, in any case. Heh, *Ti j?*"

"You are right, Tsa Barr. Outworlders may not climb the Heart Tree." The guide was removing all of his climb equipment, taking off all of the foreign metal and webbing until he was dressed only in his Kyle Murrian climb suit. "But I will go up in a moment. The Tree will permit me on its spire... And I must go up and bring back the trigger-box and the weapons ...or the Tree will be blighted forever." He moved forward and placed his bare hands against the Tree. A low song came from his lips and the cadence was picked up by the other two guides.

"Asking permission to climb," Doc said, softly. "That seems obvious. The thing to do, feeling the way he does." Doc was whispering. The moment seemed to call for whispered tones.

The other two Kyle Murrians now moved in closer to the spire and continued the song that J'Gween had begun. They had dropped off all the TSC gear too, and—except for the unaccustomed color of their climb suits—appeared very like two priests standing before an altar.

Doc thought whispers seemed most appropriate. Colonel Estaban seemed impressed by the mood too. She slung her weapon and signaled the other Marines to back away.

J'Gween began to climb the smooth bole of the central tree. He climbed slowly, moving as if in response to a ritual timed to the cadence of the song that was being chanted.

J'Gween climbed steadily up the heart-bole, moving slowly through the new branch rings, careful not to let his weight rest on their small diameters. He was careful of the Tree, but he climbed following the blood trail as it had flowed down the trunk, so he had no need to be careful of FitzRoi. Like the Tsa Marine, he knew how much blood could flow to kill a man.

Even so, his first glimpse of the Ca'tn, when it finally came, caused J'Gween to stop momentarily at the

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

sight. He knew finally, without doubt, that FitzRoi was dead, and he sang the fact into his climb-song, so that A'Lween and H'Reeh would know it too. Then he went on up to the body.

A lightning strike, smaller than the one that had formed the glade below, had broken a branch from the new tree, allowing it to tear off and leaving a long, upward-pointing splinter where the root had met the trunk. Above that point, J'Gween read FitzRoi's movements in the Tree sign.

A slime-green smear, drying on the edges marked the spot where the Ca'tn had put his hand down on the stinging protein of a *velchen*. Below the *velchen* was the white-gold tear-scar where FitzRoi's climbing spur had ripped out of the Tree wood.

FitzRoi had fallen; fallen, and landed directly on that upright splinter of the broken branch. The splinter had pierced his back, come out through his chest, and trapped his right arm against the bole of the Tree. He had lived long enough to bleed to death; the splinter was red-gold with his blood.

J'Gween climbed up beside the body. He had to find the detonator trigger, and to do that he had to go closer. The detonator was in FitzRoi's jacket pocket, and as J'Gween moved in nearer, he saw that the pocket was on the side of the body nearest the Tree—where the Ca'tn's arm was pinned. His other hand had been blocked from reaching over to the detonator by the wood of the piercing splinter itself. The guide could see the torn fabric of the man's jacket where he had clawed at it in death. He could see, too, that a section of the splintered trunk had slashed the Ca'tn's throat, explaining why he had not cried out.

"*Ahiee,*" J'Gween sang softly in his throat. He was close to the Tree here; no need to sing loudly. "So you killed him alone; and silently, he died in pain." The phrase would be added to the chant of the power of the Tree. Triumphant. . . .And so would other verses telling how the Tree had protected the Sacred Grove below by trapping FitzRoi, so that he could not get at the trigger-box. It was a great wonder. The Ca'tn had killed the Grove Guardians, challenged the Kyle Murrian Tree without honor or respect, used steel on the heart-bole, and the Tree had fought back, killing him with its own weapons. *Oh, the song would sing of the Tree's power!*

J'Gween moved in closer and searched the dead man's pockets. He pulled out the small trigger-box, his fingers barely able to hold it. He had strength to climb, that flowed out to him from the Tree, but his fingers still could not handle small tasks. However, he worked the box out of FitzRoi's pocket—its tiny red eye was still glowing—and carefully slipped it into his own pocket. That was his duty to the Grove Tree, the end result of this whole climb. One of the Outworlders, Tsa Barth, or the Marine Colonel-Mentsa, would make it safe to carry for the climb back down to the Lodge.

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

Then he moved a bit and with slashing claws broke the leather straps to the iron spurs on the Ca'tn's legs, tearing them away and tucking them into spare carry loop. J'Gween shifted the metal spurs around to ride on his back where they would not contact the Tree. He would take these back to the Outworlders too.

Next he removed the Ca'tn's pistol, working its sling up over the bloody, splintered wood and off over his head. The weapon must come away, it was a symbol of power and of the Ca'tn's crime; a symbol that could not stay to work against the new Tree's force.

The body—what was left of Ca'tn FitzRoi—that belonged to the Tree. Even if he could have lifted it up off the splinter, he would not have. The body belonged to the Tree and would stay here, high in the branches. A watch would be kept among those guides who brought climb parties this high. When the bones dired and fell away they would be found and powdered to blow in the wind...

A patch of blue on FitzRoi's body caught J'Gween's eye and he reached out to slide the climb book out of its pocket. Holding it in one hand, against the Tree, J'Gween carefully shredded it to bits with his claws, pulling the tatters out to drift among the branches in the wind eddies.

This was the Ca'tn's totem for proving his record solo climb—his mark of the forbidden thing. J'Gween destroyed it as thoroughly as time and the powdering of final bones would destroy Captain FitzRoi. He would not exist; his record was drifting on the wind; only the Giant Tree of *Kyle Murre* would survive, to stand proudly against the clouds.

Kyle Murrians all over the planet would hear the story drums tell about how their Tree had stood against its enemy and they would borrow from that strength—that long-lived patience—and go on, and on. As long as the Tree stood.

J'Gween, Guardian of the Grove Lord, sometime Climb Guide of the Tansvaal Sporting Club, began to climb back down to where he'd left his climb party. Now, his duty was to take the three climbers down the Tree safely. They had come up to the top of the Tree to help. Working with the force of the Tree, not against it, they had reached the same summit that FitzRoi had sought. Yet they were in no danger for they had climbed in rhythm with the Tree and the Kyle Murrian protective drumming had guarded them. J'Gween would continue to protect them and the drums would continue to send the strength and confidence. The three Tsarias were climbers on the Tree, now and it was J'Gween's duty to guide them safely back down to where they could leave the Tree and go back to their Offworld homes.

Of Ca'tn FitzRoi, not one thing remained that was not now part of the Tree of *Kyle Murre*. His eyes, open in death, stared upward toward the topmost branches, and beyond to the empty sky itself. Forever beyond his climbing. ■

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

home is the hunter

Some experiments work too well. But all is not necessarily lost . . .

by Stephen Tall

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

"Home is the sailor, home from sea; and the hunter, home from the hill."

The Aan spread himself comfortably over his work mound, extended a pair of ten-fingered tentacles and neatly arranged the supplies on the semicircular work table that half surrounded the mound. He structured a visual organ. With a digit tip he pressed a tab on a button-studded plate on the table.

"Alerted," a voice said. "How may I serve?"

"Make yourself visible," the Aan purred.

A diaphanous screen rose out of the floor, poised on invisible supports. It lighted, swirled with colors, then a figure showed. It turned around slowly for the Aan's scrutiny.

"Satisfactory?" The voice revealed faint anxiety.

"Good, at any rate," the Aan said. He preferred to communicate vocally, almost an eccentricity, for it was not the custom of his race. He structured an opening for the purpose, and his voice was rich and syrupy.

"I think," he said after a moment, "that you had better be physically present. A projection has limitations."

"Immediately," the figure said. "I will use the locomotor appendages. Legs, they're called. I need the practice."

The Aan noted the decision. Permission had not been asked. Already the personality was stabilizing and fitting itself to the physical being. The Aan pulsed with gratification. The technicians were getting better all the time.

A sphincter opened in the curved blue wall, and a young man strode through. He was neatly dressed in tight blue jeans, a shirt boldly checked in three colors, and strap sandals on well-shaped feet. His shoulders were wide, his arms brawny. Blue eyes looked out of a boldly planed, handsome face. He grinned, and his teeth showed big and white.

Again he turned slowly around for the Aan's approval.

"I have perfected my character," he said. "It fits the structure well, I am told. I am young, filled with need for activity, and my appearance is pleasing. The visual records and references bear this out."

Inside, the Aan pulsed again.

"You are comfortable with the body form? Your shape does not repell you?"

The young man ran long fingers through his curly red hair. He grinned again.

"Actually, I am growing to like it. It is pleasant to always have the same appearance. It is still inconvenient not to be able to structure an appendage to meet a specific need. But these I have are versatile. They serve well."

The Aan rippled.

"Only five digits. Yet it seems that the ability to grasp definitely contributed to the superiority of this race over the others of the planet. It stimulated evolution of the intellect. It is

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

unfortunate that this intellect has now become static, and may even have begun to deteriorate."

The man watched as the Aan adjusted himself more comfortably to the mond. The single visual organ became two, they drew apart, then stabilized themselves at a distance which allowed the Aan good binocular vision.

"Three-dimensional perception must be annoying," the Aan suggested, "if one is afflicted with it all the time. In so many instances it is not necessary."

"I am becoming used to it. If I wish flat vision I simply lower one eyelid. This is opaque, and shuts out the light."

"And to contemplate or meditate?"

"I lower both eyelids. Then there is no vision. During a rest period, which usually coincides with the unlighted phase of the planet, they close automatically."

The Aan allowed his body mass to flow back and forth, a habit he had when thinking. "At the time of these rest periods, the level of awareness becomes very low," he mused. "I have not experienced it, but I understand that there are sometimes illusions called dreams. In these dreams, do you have your normal body form, or this new one? Are your concerns that of our race, or the one you imitate?"

The young man shuffled his feet and looked concerned.

"You've hit on a toughy," he admitted. "Awake, I'm a man. I'd trust myself with any group. But asleep, I'm sometimes confused. The technicians tell me I talk a lot, and that most of it would make a human listener think I was nuts."

"At least, you are using the jargon naturally," the Aan said drily. "That is evidence of a good adjustment. The early analysis of your adaptability is being borne out. When the dreams become wholly of humans and their interests, you will be ready. Then you will be given a mission. In human jargon, we'll plant you and you'll be on your own. Preparations are already being made. Do you anticipate it?"

"I do," the young man said. "It's a heedless race, with many competencies —and controls growing steadily less. Logically, the one should soon cancel out the other. As attractive as they are, in the long range they are stupid. They have reached a philosophical point which obstructs further progress."

"Your studies tell you this," the Aan said. "We will see what experience will contribute. There may be reason for their behavior that we haven't suspected. At any rate, the planet is being badly hurt by them, and it is worth saving. Whether or not the species also is remains to be seen."

The simulation had been dismissed. The Aan had retracted all tentacles, dissolved his visual structures, closed and smoothed the area of his vocal opening. Fitted like an enveloping covering over the comfortably curved surface of the work mound, he gave

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

himself to contemplation. He was guided by custom, by the agreements of the Galactic Body of Fourteen, and by his own observations, but his data gathering was now approaching a critical stage. Soon conclusions would have to be drawn. And he knew that all along the length of the huge observer ship, carefully camouflaged in the glow of the system's second planet, other researchers in other laboratories faced the same problems.

Still, it was not conventional to collaborate. It was believed that this blunted creativity, clouded the reaching out for new ideas. To be an Observer was an individual thing, an intellectual pinnacle.

The planet had been under observation for a full hundred of its trips around its primary. In that hundred years its dominant species had made astonishing progress in awareness and technology. This should have been encouraging. It wasn't. The Aan was gathering his thoughts on why this should be so.

"The philosophy of a life form is structured by its experience," he mused. "And the attitude of an individual is determined by its satisfactions. This species is limited in its concerns. It has developed an exploit outlook. Basically, each individual is concerned with himself alone."

The Aan roused his body briefly, rippled vigorously for a few seconds, then nourished himself with the contents of a tiny crystal globe that he teleported from a circular cabinet across the room. He savored the energy-giving fluid. Then he discarded the globe into an opening in the semicircular desk.

"That was satisfying," he reflected, "but it is not my major concern. Self-gratification is good, so long as it is not exclusive."

This train of thought seemed promising, so he continued it.

"Every activity has two results: one, immediate and specific; the second, long-term and far-reaching. Each movement, no matter how small, affects and changes the entire environment. To a minute degree, it alters the universe."

He was pleased by the phrasing. There was nothing new in the idea; it had been basic for millenia. And he realized that by sitting and savoring generalizations, he was postponing action. The problems of the planet Earth and its dominant species, the human race, required more than philosophy. With a sigh the Aan turned to his desk, extended two many-fingered tentacles, and structured a single eye. Then he went to work.

Marilyn Cotter Carter stood before the desk and repeated her story to the sergeant. A young patrolman also listened intently, occasionally nodding his head. His eyes wandered over Marilyn's pleasant silhouette with approval.

"That's it, sergeant," the girl said. "I know it sounds stupid, but that's what I saw. I wasn't asleep, I wasn't drunk, and the sun was shining. I was still out of the car, sort of in shock,

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

when this officer came along and asked if I were in trouble."

The patrolman nodded vigorously. The sergeant raised a bushy, bristling eyebrow.

"Told you the same story, Rudek?"

"Same story, sarge. She was bothered, I could tell that. Not scared, exactly, but not pulling a fast one, either. I figured she couldn't be making something like that up as she went along."

"So you brought her here. Why?"

The officer shrugged and grinned.

"I thought you might like to hear it. I thought somebody ought to, besides me. I wouldn't put anything like that in my report without something to back it up. Would you?"

The sergeant's other eyebrow went up.

"I might not have reported it at all." He lowered both brows and looked tired. "Tell me, Rudek. If she had been fifty years old and with a face like a hatchet, would you have brought her in?"

Marilyn showed disgust, but the young patrolman didn't smile.

"Yes I would," he said stubbornly. "It might not have been much fun, but I'd have done it. She saw something, sarge. A record ought to be made."

"I got enough trouble with speeders on the road," the sergeant growled. "UFOs ain't in my jurisdiction. What could I do if I caught one? Arrest it?" He turned to the girl. "All right, miss. If you'll go over there and talk for the corporal's tape machine, and sign the paper after he types it up, I'll see that it goes into the right files, and that some copies get scattered around." He raised his voice. "Ching! Take a statement!" He looked back at the girl. "Would it hurt your feelings if the newspapers got copies? News might be slow. Maybe that's what you had in mind."

"Sergeant," Marilyn said angrily, "you're insulting!"

The heavy eyebrows wagged.

"No," the sergeant said, "just tired."

For the third time Marilyn repeated her story. The corporal listened, prompted her with questions. The tape recorder soundlessly gathered it all in. The policeman's grin grew.

"Miss," he said, "did you ever think of writing for the movies? I think you got talent."

Marilyn froze him with a look from long-lashed brown eyes.

"Officer, the sergeant *asked* for this statement. I'm cooperating. Nothing was said about you being editor. That's what happened and that's what I saw. Type it and I'll sign it."

Ching glanced hastily at the sergeant, now wearily listening to another complaint.

"Well, sorry. Right away."

Marilyn wrote "Marilyn Cotter Carter" in sweeping penmanship across the bottom of the last page, and added address and phone number.

The patrolman Rudek had lingered, and he came forward as she rose to go. Plainly, he didn't want this contact to

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

end. He smiled at her hopefully.

"Miss Carter, I didn't intend to put you through all this. I don't blame you for getting irritated. I'm just going off duty. Couldn't I buy you a drink, or something? I won't mention what you saw. We could just talk about the weather, while you relax."

Marilyn gave him her best smile, which was quite a creation.

"Thank you, officer, but I'm perfectly calm already. I won't take your time. I can understand that my little experience might be hard to swallow. But you believe, don't you, that it did happen?"

"I saw you by the side of the road. Nobody could put on an act that good, and for no reason. You had sure seen something."

"Thank you!"

The next moment the policeman was watching her graceful backside sway as she went briskly out the door toward the parking lot.

"Well," he said resignedly, "I guess she could do better than a patrol cop, at that. But I tried."

In her car, Marilyn Cotter Carter repaired her makeup, using the rear view mirror.

"Nice going, Marilyn," she told her reflection. "I almost believed you myself. I'm afraid I'm not very impressed so far. This is not an imaginative race, on the whole. Those I've contacted are dull. The young males look at me, and promptly go into a premating routine. The older ones see no farther than their occupations. The gathering of possessions is almost their sole concern. Most shortsighted."

She wrinkled an attractive nose, drew back her lips from even white teeth, gave a final fluff and pat to short brown, carefully styled hair.

"And the females; the women. They pursue the males like hunting dogs, and snarl at each other while seeming to smile. Most of the smiles I've had were venomous, thus proving that I must be sexually attractive."

She inserted her ignition key, started the motor and moved out of the precinct parking lot into the streams of traffic. Suddenly she laughed.

"I'm as limited in perspective as the creatures I've thus far met. My sample is still far too small. These people are not all there is of this culture. They are simply small parts of it. The intricate social structures, the technologies, are the products of better brains than these. Those too are here, they are working, they produce the ideas. No, after all, this is much like any other aware species. It is my contacts that are limited. But perhaps my little story to the police will remedy that, at least a little."

John Sanders leaned back in his desk chair, leisurely turning the pages of his morning newspaper. To an observer he would have seemed to be searching for something, for he glanced briefly, and the pages turned steadily. This was an illusion. Actually, Sanders read each page, read every letter and digit, sorted, categorized and remembered, with a single sweep

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

of his eyes across the print. Notices, advertisements, comic strips, batting averages, each got its comprehensive consideration. But only a brief story in a box aroused his interest:

THEY'RE AT IT AGAIN!
GIRL SEES SPACE OBJECT

Ms. Marilyn Cotter Carter no longer doubts that they are OUT THERE. She has seen them. Or at least she has seen one of them. And it wasn't in the night, a dim object streaking a dark sky. It was yesterday afternoon, in full sunshine. They weren't little green men, and they didn't ask anything about a Leader. But hear Ms. Carter, from a statement filed at the Brookside Police station: "I was driving around the Brookside Park road, going a long way home so I wouldn't have to use the expressway. The traffic on that is murder. My radio was on—two o'clock news. It went off, in the middle of the weather report, and I began to hear the music. It was soft, at first, and I thought I had just lost the station. So I adjusted the tuning, but it made no difference. The music came from every station on the dial, growing louder by the second. And no DJ every played sounds like that. I can't describe them. They were wild, but they were melodious. They were music. There was no one on the road behind me, so I pulled over onto the shoulder and tried to adjust the set. I couldn't. I turned it off. The music kept on playing, kept getting louder.

"Then I noticed that everything around me was turning pink. I know how that sounds, but this is what happened. The road, the grass, the trees, all were pink and growing pinker. And I panicked. I got out of the car and started to run. I don't know why I didn't try to drive away. I didn't think.

"The pink grew red, and even though I had left the car I could still hear the music. So I stopped. I guess I realized that I couldn't run away from it. I looked up. The thing was still higher than the treetops, but it was coming down. It was big, a huge red ball, and the light from it colored everything for hundreds of yards in every direction. It should have attracted attention for miles.

"Suddenly it swooped, and the road, the trees, the fences and my car all looked as if they had been dipped in blood. It hovered directly over me. The music dinned in my ears, and I could feel a warmth, like direct sunshine, on my skin. I thought it was the end of me. I just stood and put my hands over my eyes.

"I felt it go away. The music faded, and the heat left my skin. I opened my eyes. It was high in the air, no bigger than a child's balloon, and the color around me was normal. I was still standing there, dazed, when the patrolman came by. I must have looked strange, for he stopped, backed up, and asked if I needed help. If I hadn't been upset, I wouldn't have told him anything. I'd have known that it didn't make a bit of sense. But instead, I blurted it all out. And he was nice. He brought me here (to the

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

Brookside Police Station) instead of to a funny people doctor.

"But I did see it! And I heard the music!"

That's Ms. Carter's story. If *you* saw a red glow in the sky, yesterday around two o'clock in the afternoon, now you know what it was.

John Sanders folded the page, neatly tore out the story.

"Nothing worse than a smart reporter," he growled. "For all *he* knows, there could have been something to it. No need to hold the gal up to ridicule. Probably a young lady who could use a little publicity for some reason. She's bound to get calls from the UFO nuts. I suspect she knows that."

He considered for a moment, flashed the story across his memory again. He did not refer to the clipping.

"Well," he decided, "here goes one more!"

A phone call to the Brookside Police Station yielded Marilyn Carter's address without difficulty. A good girm tone of voice, plus his identity as a staff member of the New York Institute for the Investigation of Psychic Phenomena, was all that was required.

He found the phone number, made the call. After two busy signals he finally heard the good, firm girl-tones of Marilyn Cotter Carter. She sounded very positive and a little irritated.

"If you are a salesman, an agent, some character who wants to ask me out for the evening, or anybody else with no real business, I'm not at home!"

John Sanders laughed. He had a good firm laugh, too.

"Been giving you a hard time, have they? Well, you must have expected it. The morning paper made you out a rather enticing target."

"Get to the point!" Marilyn said.

"Miss Carter, I am John Sanders, a staff member of the New York Institute for the Investigation of Psychic Phenomena. I can give you a phone number, and you can confirm that, if you wish."

"Why should I wish? Go on."

"Good. That'll save time. Miss Carter, I believe your story. Partly because I want to believe it, and partly because around two o'clock yesterday afternoon, I saw a red glow in the sky."

The other end of the line was silent for a long minute. When the girl's voice came again it was subtly different.

"Why should you want to believe it? UFOs, whatever they are, definitely are not psychic phenomena. As for the red glow, I suspect the reporter put that in your mind."

"He didn't put it in my eyes. All right, I'll admit that I didn't see it yesterday. I saw it three weeks ago, and it was exactly as you have described. Further, UFOs are a personal concern. I investigate every report I hear of. Yours could be an important experience. Have you had others?"

For the first time, Marilyn Carter sounded interested.

"Heavens, do they come in batches? Of course I haven't had

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

others. I wouldn't have mentioned this, either, if that patrolman hadn't come along while I was still in shock."

"It's a very unusual contact. You can't have told everything about it in your statement.—Now, I heard your remarks when you answered the phone. I'm not about to ask you out. But I would like to talk to you, anywhere you say, in the presence of anyone you'd like. You may have significant information you don't even know you have."

Miss Carter seemed to be thinking that over. Finally she said, "Go ahead and ask. If you hang up, somebody just as strange will call. I'm getting used to you. The next one might not even speak good English. Fire away!"

"No," John Sanders was prompt and positive. "That would be no help at all. I have no idea what questions to ask of an unknown entity on the other end of a telephone line. I don't know what I want to know. I don't know what there is to learn. Only face to face conversation with a flesh and blood person would have any chance of turning up something new."

"You're good," Marilyn said. "You're very good. So what do you have in mind?"

"Just meet me for a talk. Anywhere you say, any time. Bring witnesses. Bring the whole Brookside police unit. Your option entirely."

"Well," Marilyn's voice was soft, "I suppose you *could* ask me out to dinner!"

In spite of himself, John Sanders was impressed. His contacts with young women had naturally been limited, since his tenure on the planet had been short. The many simulations with which he had hob-nobbed during training, while accurate and attractive, were certainly nothing like this. But then even training for war is never like war itself.

"Have you found out anything more?"

Marilyn Cotter Carter had eaten heartily and well. She had been the best of company, chattering about a bewildering mixture of trivia and current events, some of which were strange to Sanders, but she didn't appear to notice. She seemed to enjoy the sound of her own cheerful voice. And so, Sanders found, did he.

"The topic we came here to discuss doesn't seem to have come up," he said. "What with the food and the music and the finding out that you are a most decorative young woman, with brains and a good sense of humor, UFOs just sort of receded in interest."

"That's what UFOs do, isn't it? At least mine did."

"Did what?"

"Receded, dummy. Went away, up in the blue, blue sky."

Sanders grinned. His teeth were big and white, accenting a strongly planed, masculine face. He ran long fingers through curly red hair, a gesture he often repeated.

"UFOs are not a reasonable concept," he said. "I think that's why they attract me. Any beings with the technology to come here from God

LICENSED TO UNZ.ORG·
ELECTRONIC REPRODUCTION PROHIBITED

knows where in space wouldn't be content just to sneak around and look on. They wouldn't have to. They could move in—take charge. We have nothing approaching such ability. There'd be nothing to keep them from it."

"You're thinking Earth," Marilyn said. "Maybe they'd be too civilized, too advanced for that. They could have come to understand that might isn't right, and that property is not for the taking. Or, it's possible that they'd simply be studying an environment, studying the habits of a less advanced species."

"Hard on the ego," Sanders said. "Harder on the believing mind. But the things keep cropping up. Experiences like yours. There's more to that. I don't know why, but I feel there is."

"It certainly seemed pointless," Marilyn agreed. "I like to think that I was the target, too. But it did nothing to me or to the car, and went away promptly. And nobody else saw anything."

"Oh no, you don't trap me like that. I told you on the phone that I saw a glow—and I did. It was weeks ago, so it wasn't yours. But I saw it from my apartment window, in the direction of Brookside Park. And if I saw it, others could have. I thought nothing of it until I read your story. The things may be occurring regularly."

"That silly story," Marilyn said, "made me out a fool, and didn't take half a dozen sentences to do it."

"Well, I believe it," Sanders said, "and I'm not through exploring why. Do you suppose we could dance? I won't boogie, but I can represent an older, more civilized, more intimate culture."

"Like last year," Marilyn giggled. "Let's try!"

The Aan covered the smooth surface of his work mound, his body spread so thin that its edges almost touched the glistening, pale green floor. He was resting, contemplating on a shallow level, yet he was completely aware of every flicker of light on his work table console. A red light flashed. He sensed it, then structured an optic to verify the sensation.

"Alerted." The vocal orifice appeared automatically. "Has the matter enough consequence to interrupt meditation?"

"According to your instruction, Your Radiance," the desk speaker said. "Remote communication. A report from John Sanders."

"Ah yes." The smooth clear body rippled with satisfaction. "I have hopes for him. I have never planted a better simulation. Bank the full report. I'll consult it after I have completed contemplation. One thing at a time. But give me the kernel of it. Just the gist. I'll include it in my meditation."

"The gist is," the voice said drily, "that he wishes to remain a human. He finds the race intelligent and fascinating, the life-style exactly to his liking. He requests formally that he be allowed to stay on Earth, and that his mission be terminated."

The Aan had not been surprised for

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

five hundred years. He prided himself on it. But this news shook him so that his body retracted into a ridged ball, and gradually became cloudy.

"Remain alert. I am thinking." His voice was sour, not syrupy.

The red light glowed on the desk. Slowly the Aan adjusted, and his body cleared and again fitted itself to the smooth comfort of the work mound.

"Somewhere in the report there is a reason for this. Abstract it for me. Meditation is postponed."

"The reason is conspicuous," the desk speaker said. "It involves the procreative habits of the species. He has fixed his attentions on a human female and wants nothing except to mate with her. Apparently they go quite mad at such times. Irrational. He must indeed be a complete simulation."

"He is. But I had not anticipated this. We had, in fact, paid little attention to the habit. It could well be the explanation why the population of the species is increasing so rapidly. If so, John Sanders has made his contribution."

"The report describes it at length," the speaker volunteered. "The fixation is called 'falling in love,' and is not, in its earlier stages, a reasonable state. And, before or soon after mating, there is usually a ritual called 'marriage.' All varieties of the species seem to practice it in some fashion. It is often elaborate, and is supposed to restrict each partner to the other for mating purposes. And only man has it, apparently."

"It is evident that I must consult the full report," the Aan said. "Place it on transcription. I will absorb it at once."

"Acknowledged."

A different light showed green on the console, but the Aan ignored it. He rippled uncomfortably. Finally he concentrated on the cabinet across the room and teleported from it a tiny crystal sphere containing a ruby red liquid.

"I rarely need a pick-me-up," he told himself, "but this is certainly justified. It's not as though I regularly require stimulants."

Having savored the fluid and disposed of the sphere, he turned with decision to the green light. The report flowed through his consciousness at quadruple speed. In a few brief time units he had absorbed it. Then he rippled reflectively.

"It is not a complex problem. Just unlikely, and a little annoying. As an observer, he is spoiled. Even if the experience and the memory are expunged, the protoplasm will be scarred. He would not be effective." The Aan sighed. "Here is a case of a simulation being too perfect. Note will have to be made of that."

A curious amber light appeared on the console. The Aan studied it, then resorbed his single eye and began to glow gently.

"Alerted," he said. "I am honored, Your Luminescence."

"You are gracious, Your Radiance," the desk speaker said. "It has been ten solar time units since we touched consciousnesses. I have an item you might use. May I materialize?"

"That would be friendly," the Aan said. "We can have visual impact, ex-

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

change items, and share a mild stimulant. For I realize now that I have an item for you."

A disturbance in the space just beyond the Aan's work table shortly became another mound. Sprawled on it, thin and relaxed, was a being that could have been the Aan's mirror image. The two clear, amorphous forms were visually identical. And around each hung a faint ghostly glow.

"Welcome, brother," the Aan said. "When work is going well, I forget that an occasional physical contact is pleasant." He structured an optic. "Your appearance has not altered."

"You, too, appear vigorous," the DurAan said. He had materialized with an eye already formed. "I am relieved to hear that your work progresses. Mine has taken a rather unexpected turn."

"This is your item?"

"Correct." The DurAan rippled uncertainly, and allowed his eye to rove freely from one side of his body to the other. "I am a bit embarrassed," he said finally, "and yet I shouldn't be. I have done a job too well."

"Expand this," the Aan said. "You have my full attention, for I fear that I have done the same thing."

"Unlikely." The DurAan's eye was fixed on the cabinet, with its circular shelves well stocked with spheres of fluids in many colors. Then he drew his body into a state of decorous attention, the optic directed at the Aan, and plunged into his story.

"Forty Earth days ago I planted an observer on the edge of the area called New York. This agent came from a protoplasm mass highly motivated for such work. She was the most perfect simulation I have ever achieved. A young female, well informed, attractive to males, interested in everything. My technicians outdid themselves."

"The account is strangely familiar," the Aan murmured. He had opened a speaking orifice, and his voice was rich and fruity.

"I landed her, with a vehicle appropriate to her simulation, from a red sphere landing unit. These are conspicuous because of the glow, as you know, so I hoped that her advent would attract immediate native attention. They could not see her disembark, and she could give a fanciful account of the visiting ship. This would establish her in the area as a person. The environment, of course, had been prepared for her for many time units past."

The DurAan's eye roved to the fluid cabinet again, but he brought it sternly back.

"As it happened, no one saw the unit that landed her. I was forced to send it several times before she could meet it and appear to be frightened by it. But finally that was achieved."

His protoplasm swirled impatiently. "Details are not important. The point is, she has become too completely accepted. And she has fixed her attention on a human male, and wishes to mate with him in the fashion of the species."

The Aan rippled, and closed his speaking orifice to smother a chuckle.

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

"There could be no young," he observed. "No matter how perfect the simulation, she is not human. Where's the harm?"

The DurAan's one eye surveyed him suspiciously. They were from the same strip of protoplasm, genetically identical, and he knew that the Aan was laughing at him. They reacted alike to most situations.

"You know well enough the harm. Waste of time, waste of planning. I must begin again, for she refuses to return to the ship. She *likes* being human. She says the species has a great future."

"I ask pardon for seeming to lack sympathy," the Aan said soberly. "It was partly surprise. Hear *my* item." And he told of the placing of John Sanders.

"We have experienced coincidence before," the DurAan said. "We work alike. Though we have been detached for a thousand Solar years, we are essentially the same. But this does strain credulity. Where was your agent placed?"

"He was placed," the Aan said slowly, "where it will strain credulity even further. And I now wonder—"

The two body masses flowed back and forth in violent agitation, while all thoughts and data were shared, correlated, simplified, and finally reduced to the obvious answer.

"The odds against such a happening would make a pleasant problem for the mathematician-protos," the DurAan said. "Would it be a bad pun to say that they are astronomical?" His eye was drawn again to the fluid cabinet. "Did you mention something about sharing a stimulant?"

"I have an excellent stock," His Radiance said. "I am not an addict, you understand, but at this time something mild does seem indicated"

"But not too mild," said His Luminescence.

The steady roar of Niagara Falls rose and enveloped the pair of people leaning against the railing of an overlook, but they scarcely heard it. They had eyes and ears only for each other.

"Only you," Marilyn Sanders said, "would have thought of coming to Niagara Falls for a honeymoon. It has been fifty years since limited transportation made this popular as a place to begin a life-long habit."

John Sanders grinned, and tightened the arm that lay around his wife's shoulders.

"A good habit, from what I've had of it," he said. "This was near, and had tradition. Time was when the sound of popping maidenheads could be heard above the noise of the falls. No more, of course. In fact, by the time people now get around to entering this state we've just formalized, there's usually nothing to pop."

Marilyn giggled.

"Fool," she said. "Cynic, too. I'm sure you didn't come here just to listen to echoes from the past."

"Take you anywhere you want to go," he offered. "Yosemite Falls, Victoria Falls, Murchison Falls—you name it."

"Or maybe even to some place

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

where there aren't any falls? No, John, this is lovely. Anywhere you are is lovely. I never, at any time in my existence, ever thought of anyone like you, friend. And you will never be able to imagine how true that is."

"Maybe not," he said gravely, "but I wouldn't count on it. I've dreamed about you for a thousand years. My imagination has ranged over half the galaxy, just searching, hunting for you."

"And now the hunter is home," she smiled. Remember Stevenson's *Requiem*?
'Home is the sailor, home from sea;
and the hunter, home from the hill.'"

"But that was an ending," he objected. "This is a beginning. We're here, together, by this mutilated Earth waterfall, and life is good. I don't try to understand it. I just know that it's so."

Four tiny crystal globes hovered in air midway between two work mounds. They were empty. On the mounds the Aan and the DurAan lay rippling sluggishly. Their bodies were clear, thin, relaxed. The Aan's vocal orifice opened flabbily.

"Some benefit can come from anything," he stated. His voice was rich, fruity, and becoming a little mushy.

The DurAan rolled his single bleary eye.

"And you have determined a benefit from this—happening?"

"Of course. Just a matter of a little meditation. The red fluid is best for that."

"I enjoy the flavor of the green," the DurAan said. "But speak your benefit."

"Let them be human. They are, anyway, even to the limited life span. Remove communication. Let them be human—and forget."

"We benefit from that?"

"We do," the Aan said smugly. "They will have offspring."

"I should have had the red fluid," the DurAan sighed. "I do not understand."

"*We* will provide them," the Aan explained. "Our technicians have shown themselves to be superior. We will provide protoplasm already genetically trained. Each offspring will be born, grow, and be a pleasure to its parents. But they will all know their missions—and *they* will report to us!"

"Second generation simulations!" the DurAan said. "Genius!"

"Like all great ideas, it is basically simple," the Aan said modestly. "The details we may safely leave to the technicians. It is the thought that must first exist."

The DurAan's eye roved once again to the cabinet, with its rows of treasures.

"And the red fluid helps. Perhaps I should try it."

"You are a guest," the Aan said. "I will, in courtesy, join you."

Two ruby red globes moved from a shelf and poised, one before each gently glowing being.

"To success!" His Radiance proposed.

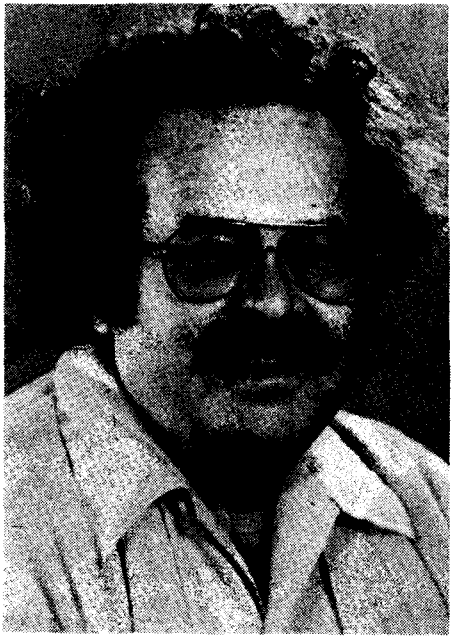
"Cheers!" said His Luminescence. ■

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

BIOLOG

William E. Cochrane/S. Kye Boult

As far as I know, the ambition of anyone in high school who has a science fiction collection is someday to be a science fiction writer. Just prior to World War II, William E. Cochrane was in high school and had a three-room collection of science fiction magazines. An appearance in 1950 and another in 1953 in a semiprofessional science fiction magazine under the name of Leo Paige was followed by a diverse career in other fields, until the June, 1971 issue of Analog with the first use of the now famous S. Kye Boult nom de plume. Readers of the April, 1973 issue saw the Cochrane name appear for the first time.



by Jay Kay Klein

Bill is now a full-time science fiction writer, but the detours to this goal led along the tortuous paths popularly supposed to be trod by writers on their way to ultimate fame and fortune. Having finished with World War II after service in the U.S. Air Force, he went to Los Angeles City and State Colleges, studying Theatre Arts, along with Physics and English. He later spent a semester at a local college to learn more about Electronics.

Bitten by the theater bug, he held a variety of craft jobs at MGM, local playhouses, and NBC as stage designer and carpenter while acting and directing in storefront theaters with his wife in their spare time. Other studio jobs included electrician and film editor, with Mrs. Cochrane working in script departments.

In between times, Bill worked as a draftsman, designer, and technical writer for aircraft and later aerospace companies. Bill comments that any dullness his previous jobs might have had was dissipated when he undertook to design explosive devices for guided missiles. It was the aerospace layoffs in the 1970's that brought him to putting words down on paper for Analog editor John Campbell.

Berkely Books brought out Bill's first novel in 1976, and Analog Books will publish his second, Class Six Climb, after serialization in Analog. A third is underway. At this point, he has proved to his satisfaction that you can sit with your feet up, hands behind head, staring at the wall—and be hard at work. And Bill still has his collection of old science fiction magazines.

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

the energy DISASTER

by Jerry Pournelle

Well, it happened. We've all known it would: only fools thought nuclear power was *safe*. Now the "disaster" at Three Mile Island has confirmed our worst fears. Radiation has been released to the atmosphere. There's radioactive iodine in the milk. We almost had to evacuate a city. It must be obvious to everyone that it's time to shut those hellish nuclear plants down before they kill the lot of us.

Of course that will be expensive and damned inconvenient, but surely no one but a monster would put mere money and convenience ahead of public safety. End of discussion.

Nuclear power, saith the sages, is doomed: even those in favor can't argue for it *now*.

I'm writing this a few days after the incident: at this moment it's assumed that the plant will proceed normally to cold shut-down, but it hasn't got there yet. Furthermore, no one, including a vigorously pronuclear vice-president of the American Society of Nuclear Engineers, will *assure* me that nothing worse will happen: it's still conceivable (although highly unlikely) that they'll have to evacuate areas near Three Mile Island. That's a fairly significant datum, and I'll return to it later: for the moment let's assume things do proceed normally, and the incident is for all practical purposes over. Wasn't it disaster enough? And shouldn't all sane people now realize that nuclear power is a deadly trap?

I don't think so; and I don't consider myself a monster.

To begin, the accident wasn't entirely unanticipated: you can find the basic incident in the Rasmussen Report as accident TMLQ-epsilon: a feedwater pump trip with a valve stuck open. Rasmussen gave this event a probability of 5×10^{-6} per reactor per year, meaning that if you operate one hunderd over a period of twenty years, there is one chance in one hundred that the accident would happen, and 3.5 chances in a thousand that this particular accident would have happened by now. (He was making educated guesses, of course: how can you compute the probability of an event that has never happened? Or for that matter, what probability do you assign to it now that you've got one occurance?)

Of course the Three Mile accident

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

was much worse than Rasmussen's report assumed: he hadn't anticipated that certain emergency systems would have been left inoperable by maintenance crews, or that pressures would fall so low that the operators would shut down pumps, that the relief valve would stick, or that sump pumps would pump contaminated water out of the containment; and *nobody* expected the hydrogen bubble to form inside the reactor vessel. Rasmussen may have insufficient faith in Murphy's Laws.

But for all that—what did happen? Not much, actually. Some radiation was released, but if you'd followed the cloud about and stayed in the hottest part you'd have managed to accumulate something between .1 and 1.5 millirems per hour. My latest information indicates that the maximum dose you could have given yourself outside the plant perimeter is about 85 millirems; last night I took my son to the clinic and the doctor deliberately dosed him with 30 millirems in the form of chest x-rays. Furthermore, there's no evidence that anyone actually got an 85 millirem dose.

Incidentally, for those confused, radiation is measured in several ways. The Curie is a unit of radioactivity, related to the number of nuclear disintegrations per second, regardless of what is disintegrating or what radiation is given off. The crucial effect of radioactivity is its ability to ionize: to tear apart the atoms of whatever it encounters. The ionization effect is measured in Roentgens; however, some ionizing radiation is more harmful than other kinds, so the health physicists use a third unit, the REM, meaning "Roentegen Equivalent Man," which takes into account the particular brand of ionizing radiation. Curies and Roentegens are meaningful chiefly to physicists; rems are important to you and me.

The millirem is of course one thousandth of a rem. Safe level of exposure for nuclear plant workers is set at 5 rems (5000 milli-rems) per year. Normal background exposure in the U.S. varies from 125 to 200 millirems/year depending on where you live (higher altitudes mean higher exposure), what you live in (rock contains small quantities of uranium, and living in a stone or even brick house can increase your exposure by 10 to 30 millirems/year), and other factors. There are places in the world (near uranium or thorium deposits, naturally) where the background radiation is 5000 millirems.

For the average person, the major source of man-made ionizing radiation is medical x-rays. Other man-

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

made sources include color TV sets, fall-out from nuclear tests, and, way down near the bottom of the list and well below most natural sources, nuclear power plants. The releases from the Three Mile Island incident, then, are (as I write this) trivial.

That's not the whole story, of course. Even though the amount released is trivial, there are substances that can be concentrated by biological processes. The most important of these is iodine—and lo, say the headlines, radioactive iodine has been found in milk near Three Mile Island.

That's the headline. I read the whole story—and back on the third continuation (add-3 as journalists are taught to say) I'm told that the NRC couldn't find the radioactive iodine at all. They had to take the samples back to Washington and use the FDA's supersensitive equipment. I read on, and in add-4 I find that the FDA official who conducted the tests says "Of course, you'd find that much (40 picocuries) in milk you took anytime and anyplace..."

And this was in the *Los Angeles Times*, which did carry the real information back in add-4. I shudder to think what less responsible papers did with the story.

So, I repeat, just what is the disaster? A few plant workers exceeded their quarterly allowable dosages, and were sent home—while not 100 miles from Three Mile Island, and at exactly the same time, 6 coal miners were trapped underground. Three of the miners are known to be dead—and I'm unable to find anything more in my local papers, which are too busy reporting the nuclear "disaster."

The nuclear industry remains one of the world's safest, and as I write this, no member of the public, not one, has ever been killed as a result of a nuclear accident in a power plant. The Three Mile incident very likely was a disaster, for all of us, but not because of any direct damage to the public.

There's a considerable time lag between the time I write these columns and their appearance in print; and I haven't forgotten that my nuclear engineering friends flat-out refuse to assure me that nothing will have happened by the time you read this.

Let's assume the worst: as they continue to cool Three Mile Island, there forms another hydrogen bubble, and this time it gets into the containment with enough oxygen to blow everything sky-high. Lots of radiation escapes, and they have to evacuate a goodly number of people.

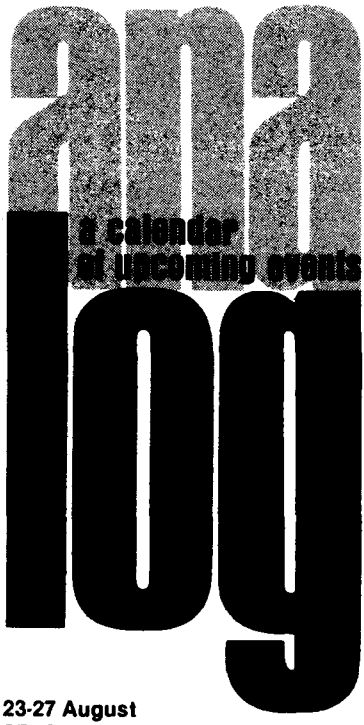
Meanwhile, *another* plant fails.

Won't that prove that atomic power is dangerous?

Of course it will, but don't we already know that? Only a fool would believe that nuclear power is *safe*. It merely happens, on record and in theory, to be the safest form of power we have; and that seems likely to remain true.

There's a low probability that even this late in the story they might have to evacuate an area of Pennsylvania; but they darned well *did* evacuate half the

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED



23-27 August
SEACON 79 (37th World Science Fiction Convention) at Metropole Hotel, Brighton, U.K. American Guest of Honour—Fritz Leiber, British Guest of Honour—Brian Aldiss, Fan Guest of Honour—Harry Bell, Toastmaster—Bob Shaw. Registration $10.00 (supporting) $20 (attending). Info: SEACON '79, 14 Henrietta St., London WC2E 8QJ, U.K. This is the science fiction world's annual get-together. Professionals and readers from all over the world will be in attendance. Talks, panels, films, fancy dress competition, banquet, the works. Join now and get to nominate and vote for the Hugo awards and the John W. Campbell Award for Best New Writer.

---

30 August—3 September
NORTHAMERICON (Second NASFiC) at Galt House, Louisville, Ky. Guest of Honor—Frederik Pohl, Fan Guest of Honor—George Scithers. Toastmaster—Lester del Rey. The second North American SF Convention. Registration—$15 until 30 June,$20 thereafter and at the door. $7 non-attending membership. Art show, hucksters. Info: NorthAmericon, Box 58009, Louisville, KY 40258.

---

29 August—September 1980
NOREASCON TWO (38th World Science Fiction Convention) at Sheraton-Boston Hotel and Hynes Civic Auditorium, Boston, MA. Guests of Honor—Kate Wilhelm and Damon Knight, Fan Guest of Honor—Bruce Pelz, Toast-master—Bob Silverberg. Registration—$20 until 30 June 1979, non-attending membership $8 at all times. This is the SF universe's annual get-together. Professionals and readers from all over the world will be in attendance. Talks, panels, films, fancy dress competition, the works. Join now and get to nominate and vote for the Hugo awards and the John W. Campbell Award for Best New Writer. Info: Noreascon 2, P.O. Box 46, MIT Branch Post Office, Cambridge, MA 02139.

INTERSTELLAR MOLECULES [I.A.U.] at Mont Tremblant, Quebec. Info: J.L. Locke, Herzberg Institute of Astrophysics, National Research Council, Ottowa, Ontario, Canada KIA 0R6.

CLOSE BINARY STARS: Observation and Interpretation [I.A.U.] at Toronto, Ontario. Info: C.T. Bolton, David Dunlap Observatory, Richmond Hill, Ontario, Canada L4C 4Y6.

Anthony R. Lewis

Items for the Calendar should be sent to the Editorial Offices, ***four months*** *in advance of the issue in which you want the item to appear.*

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

city of Long Beach a few years ago when an oil-storage tank caught fire.

There's a higher probability that one or more nuclear workers at Three Mile may be killed, either in shutdown or decontamination; but there were nearly fifty fatal accidents in coal mines last year, and that's the lowest number in decades. On the way home tonight I heard that an oil tanker had gone down in the Pacific, number of sailors lost not yet known.

Given the radiation released, and that which will be released in decontamination (there will be some; procedure is to hold the gup for a while and release it gradually when it's less active) we can calculate that over the next twenty years there will be between .5 and 5 "extra" cases of cancer in the general population as a result of the Three Mile incident. That's scary: but how many children will be killed in grade-crossing accidents by trains carrying coal? How many members of the general public will die of emphysema from breathing smog? How many cancers will be caused by coal stack gasses?

No: nuclear power isn't safe, but neither is anything else; and that's the point of this column.

At least we *know* the costs of nuclear power, and they're a *lot* lower than the costs of any other presently available power source. We don't have very good statistics on emphysema (although it's a fairly safe guess that coal kills about 15,000 people a year from all causes)—but I can with some confidence predict the number of "extra" cancers from Three Mile.

We know from watching the Hiroshima survivors that there will be about two hundred cancers per 10^6 man-rem. You get man-rems by dividing the total dose by number of people exposed; Three Mile has released about two hundred man-rems; the papers say 400,000 people were in the exposure area, which works out to .4 cancers. That's a fairly low cost; in fact, it's fair to say that the people living in the rain-cleaned air around Three Mile Island last week were exposed to lower air-borne health hazards than were we Angelinos with our sunshine and smog. Just because we don't know all the true costs of energy from coal and oil doesn't mean they're trivial.

Which brings us to the bottom line: what effects will Three Mile have? I'll discuss three, one certain, one probable, and one I can hope for.

The certain effects are technical: within a couple of years every nuclear reactor will have a remotely-operated bleeder valve capable of dealing with hydrogen bubbles in the reactor vessel. Within weeks they'll all have warning systems making it highly unlikely that valves closed for maintenance will inadvertantly remain closed. Within days we'll have new emergency operation procedures, and those will be refined and refined again, so that this particular accident sequence won't happen again.

The probable effect is psychological: analysts are saying that Three

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

Mile was the death knell for nuclear power (in the United States; France and the Soviet Union have already announced that there'll be no changes in their vigorous nuclear reactor construction program). Nearly everyone agrees that power companies will now be very reluctant to build reactors.

The effect I hope for is also psychological: that we as a nation will wake up and face the fact that civilization is not free; that *everything* costs in both money and risk. If we begin to think that way, we can have an intelligent debate over the future of nuclear power. What is it worth to avoid nuclear plants? Our standard of living? Inflation and the consequent total dependence of the elderly and retired? If none of the above, what will we substitute for atomic power plants?

Coal? Will we kill more miners or encourage strip mines? Or both? Are we willing to lay track for the necessary railroads, and endure the inevitable accidents that will accompany mining and transporting ten billion tons of coal each year? And what are the actual climatic effects of pumping all that CO_2 into the atmosphere?

Solar? Will we *really* look at solar energy? Face the fact that at the moment it takes from fifteen to thirty times as much energy to build a solar power system as the system annually can produce? That ground-based solar energy systems are *big* (tens of square miles) and probably require pumped-storage systems to support them?

Or the exotics, fusion and solar power satellites? Both require massive investments, neither is certain, and both will have inevitable costs in lives.

If Three Mile makes us all realize that we face hard decisions, then the lesson was cheap; if it merely provides more ammunition for the game of politics, then it was a disaster indeed. ■

in times to come

● *For many of our readers, September's lead story will be a welcome renewal of an old acquaintance. For others, Orson Scott Card's* Songhouse *will be an introduction to a special place where the art of song is raised to levels hitherto only dimly imagined—and the special little boy who became Mikal's Songbird. Ansset created quite a stir when he first appeared in these pages last year—and his story came very close to winning its teller a Nebula Award. In* Songhouse, *we meet Ansset at an earlier stage in his life, when he was becoming what he was in last year's story. What did that take? A Songbird, of course, is much more than an Entertainer—and becoming one takes much more than technical proficiency. It's a striking story, with a striking cover by Paul Lehr.*

Songhouse *is unusually long for a one-issue story, but we'll still have room for a generous and diverse selection of short stories, all our usual features, and an article by David Ritchie—"Future Food." Feeding the Earth's population is basic to all the problems that must be solved in coming years, and some of the solutions may be found in unexpected places.*

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

no damn atoms

(All the rest of this piece was written two days before the well-publicized accident at Pennsylvania's Three Mile Island plant. I'd written a paragraph that I cut from final draft: now that *The N. Y. Daily News* has run, as news, a picture of Jane Fonda looking grim and terrified (from the movie)—and everybody, including the wire services, has mentioned *The China Syndrome* several times in coverage—that paragraph ought to go back in, as an introduction:

Proatomic groups are, I begin to realize, in a no-win situation. As long as no noticeable accident occurs in a nuclear plant, antiatomics arguments can begin with: "There is no way of proving that nuclear power is 100 percent safe," as of course it isn't—nothing else is, either; as soon as an accident occurs, no matter how well contained *the arguments will begin with newspaper stories' headlines "NUCLEAR PLANT EXPLODES" or "CHINA SYNDROME NARROWLY AVERTED." In other words, you can't build an atomic plant either because there hasn't been an accident, or because there has.*

Recent events change not one word of that paragraph, nor of the paragraphs to follow. With the news coverage, then, comparatively fresh in all our minds—now, go on with the story.) *L.J.*

The China Syndrome, a movie warning us all against a future (and impossible) catastrophe, turns out to have a small bit of my past wrapped up in it. A fair number of years ago, the neighborhood of Columbia University was swept up in hysterics: there were plans to install a teaching reactor. (The reactor, finally about to be useful,[1] is once again the center of scream and quaver, but I don't live uptown just now.)

I got tangled in the arguments among civilians (non-Columbians living nearby). I kept trying to explain that the chances of the thing exploding (or of a core meltdown—the China Syndrome) were about equal to the chances of your average loaf of health bread suddenly taking off on an individual mission to Jupiter. This was, and is, true: it is a training tool, and the capacity for large-scale accident is not built into it. But truth never seemed to make any particular difference; and one civilian, a reasonably ill-tempered man, cut me off midstride with a sentence I have never

[1] As I write, the thing is apparently cancelled again—thanks to your local newspapers and TV stations, who have shown a surprising resemblance to the old man in an ancient cartoon, carrying a sign that read: THE END OF THE WORLD IS UPON US—PRETTY SOON NOW.

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

[redacted]

been able to forget: "We won't let them build the thing," he said; "we don't want no damn atoms around here."

Watching *The China Syndrome,* there I was again, surrounded by people on and off the screen who don't want no damn atoms around here. I still have no idea how to reply to that, but this time I'd like to try.

And I ought to begin by saying that the movie, as a movie, is full of fine things, and occasional disasters. By now, everybody ought to know that Jane Fonda is a most remarkable actress; that James Bridges remains (as he has been since *The Baby Maker*) a quiet master of plain prose camera work and direction; less happily, that Michael Douglas' major talent, the dampest set of eyes this side of Lassie, has the usual TV-soaper effect; and that if Jack Lemmon (who manages his final scene to magnificent effect) gets one more part requiring him to say: "Oh, my *God,* why won't you listen to me?" it may be the ruination of a very fine actor, and will certainly grind the last little bits of dentine off his teeth. Nobody seems to have noticed that Mr. Douglas takes us all back to the Eisenhower years with an occasional "nucular power," or that Al Baietti, as a pro-nucular-power witness, stubs the same sore toe, and I wish this were a minor matter.

On the evidence, though, it is a symbol: *The China Syndrome* has got things just about as mangled as two actors have got "nuclear." (Mr. Baietti only has one crack at the word; Mr. Douglas has any number, and now and then gets it right, or nearly right, or anyhow not entirely wrong.) This movie is scaring a great many people, and while everybody out there is worrying about the effect made on impressionable young thugs by *The Warriors* or *Boulevard Nights,* maybe we ought to worry a little about the clear attempt to whip up anti-atomics mobs made by this movie. As even a *New York Times* editorial seems to have noticed, the attempt is not built on many facts; but, then, it scarcely has to be.

The catastrophe meant to scare hell out of us does not quite happen; it is—twice!—avoided by perhaps a hair-and-a-quarter. But it can happen any minute, says the movie. It is a loss-of-coolant accident which leads to a core meltdown (the reactor core can't explode, but it can melt straight on down through bedrock, though not all the way to China), and is flatly described as follows: such a meltdown will lead to an immense radioactive cloud killing everybody in an area about the size of Pennsylvania ("not to mention all the cancers to come later"—nor the lengthy list of other disasters, if events work out as described). This will happen because the meltdown will go on through bedrock until it hits ground water, at

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

which point it will turn into a great burst of steam and come right back up again out of the ground, to take up residence as a radioactive cloud.

Really?

Let's begin with the site of the plant. If it were built over a near-surface pool of ground water, there would be a great many screams, a good percentage from the regulatory agencies involved (the only agency presented in the movie is a supine rubber-stamp): radioactive ground water is not much wanted. But no one mentions this: the implication is that it doesn't matter how far down that water is.

If the reactor is sited sensibly, though, the ground water effect may not even happen. As the meltdown drops, it cools; it doesn't all cool at the same rate or (as temperatures change) progress downward at the same speed. the likeliest possibility involves a negligible addition to the amount of radioactivity already naturally available underground.

If the ground water is close to the surface, though, we still don't get that cloud. A lot of water will turn into steam—but the path back to the surface is the path of *most* resistance: against the meltdown. There is always, repeat always, a horizontal channel or a channel heading down, because ground water travels around a lot. The steam will travel, too, until it dissipates; radioactive ground water will result in this case, but a radioactive cloud the size of Pennsylvania is a whole different order of trouble, and not a possible one.

Look: even if it tries, the steam is not going to come back up that meltdown hole: the reactor and main building provide a large and very effective cap.

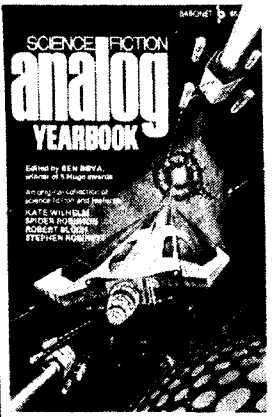
It is scarcely necessary to mention the rest of the plot. In brief: everyone concerned is willing to go along with the uniform villainy of the plant workers, the plant management, outside contractors, and a Board of Directors. Everyone. Some few (first Ms. Fonda, then Mr. Lemmon, and at last a sprinkling of others) are converted by Mr. Douglas, playing a TV-news cameraman—whose *starting* position in the movie is that he has no idea what he has just filmed, but that it should be seen instantly by the largest possible TV audience. Mr. Douglas is more likely than I would like to think; the universal good-German villainy (or worse) which surrounds him is as wildly unlikely, and for the same reasons, as the proposition that all the workers, managers, contractors and Directors are saints.

Atomic power is about the safest form of energy we are likely to have around for a good many years. It would be helpful if somebody came up with a way to communicate with the people this hysterical movie is frightening, if only to instill a little calm.

Though how you do this with a guy who don't want no damn atoms around here, I have no idea. Against *The China Syndrome,* unhappily, the gods themselves may be struggling in vain. ■

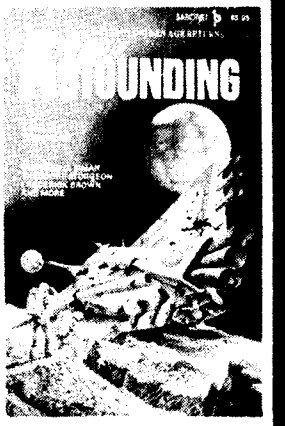
LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

announcing the first two books from analog's new series



An original collection of new stories that will send you out of this world. Ben Bova, award-winning ANALOG editor, has assembled an exciting collection of stories and features, including: "Julian" by Kate Wilhelm, "Too Soon We Grow Old" by Spider Robinson, "Oh Say Can You See" by Robert Bloch, "Kingsmeat" by Orson Scott Card, "Guzman's Gardener" by Stephen Robinett, "More Deadly Than the Male" by Sam Nicholson. Plus a guest editorial by Greg Benford and fascinating features on immunization against cancer, science fiction on film, etc. In short, a fully illustrated collection of winners you won't want to miss.

Paper bound • $5.95



Edited by Tony Lewis

Science fiction's golden age returns. It was a time when the field of science fiction came into its own, guided by the imaginative John W. Campbell, Jr., who tapped the most fertile minds in the field. Here are classic stories by Clifford D. Simak, Theodore Sturgeon, Frederick Brown, and many more, all republished with their original illustrations. Hours of fascinating reading and a valuable addition to any serious science fiction collection.

Paper bound • $5.95.

e coupon page 177

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

PROBABILITY ZERO:

The Astounding Adventures of Isaac Intrepid

Mike Resnick and Lou Tabakow

The world was in chaos.

Fourteen new and virulent strains of influenza had appeared, as well as four mutated strains of syphilis. Dozens of new diseases appeared every week, and most of them withstood medical science's every effort to eliminate them. Even those serums that were mildly effective against one new disease seemed totally helpless against all the others.

Finally, in desperation, a group of colleagues called on Isaac Intrepid, who was in the midst of revising his 4th edition of *Intrepid's Guide to Mesopotamian Paints and Dyes.*

He pondered for a moment and then, struck by inspiration, made a single phone call, drove quickly to a designated meeting place, and returned home. He worked furiously throughout the rest of the night, then made his findings public the next morning.

"It passes every test," said an astonished Mitterwald of M.I.T.

"Unquestionably your greatest breakthrough, Doctor Intrepid," said Wilkerson of Harvard.

"There's no doubt about it," chimed in Torginson of Columbia. "You've won yourself another Nobel."

Professor Torginson's prediction proved quite accurate, and after the Nobel Prize winners had been announced, Intrepid called his mother to inform her of this newest honor that an awestruck and worshipping world had bestowed upon him.

She made proud sounds in a properly motherly way, then paused.

"Yes, mother?" said the great man. "Is anything wrong?"

"Well, I don't want to be pushy, Isaac—but when are you going to return my recipe for chicken soup?"

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

Professor Walter James Miller, has, in his **The Annotated Jules Verne: From the Earth to the Moon** (Crowell $16.95) shed new light upon the importance of Jules Verne, one of science fiction's founding fathers. This is the second in a series of books by Miller, rendering into English the complete French text. He also did this with the first book in the series, *The Annotated Jules Verne: Twenty Thousand Leagues Under The Sea.* Unfortunately, Crowell did not follow the practice in that first book of using a different typeface to show cuts in the English version. This might be due to the fact that here are five versions in English (as Miller indicates in Appendix B of this book). Miller, a professor of English at New York University, has added numerous illustrations from various French editions plus material from textbooks and encyclopedias of the period to assist the reader in understanding the many facts that Verne inserts into his book.

Shortly after the end of the American Civil War, the Baltimore Gun Club, composed of members who improved the art and/or science of weaponry, decides, under the leadership of their president, Impey Barbicane, to send a projective to the Moon and then back to Earth. This is to be done by means of a huge cannon buried in Florida. The bulk of the book describes the raising of funds and the technical details of building the monster cannon. Verne later wrote another book to show the details of the trip itself and that book is usually printed with this book as *A Trip to the Moon and a Journey Around It.* This book ends with the projective landing in the ocean, so much of the suspense is removed from the sequel.

It is interesting to watch Verne at work, adding detail upon detail, fact upon fact until a mighty mountain of reality stands waiting to receive that last straw of fantasy that Verne hopes will collapse the whole accumulation into a believable reality that the reader must accept, because of the number of facts involved. Miller makes many claims as to Verne's importance and they are mostly true. Unfortunately, Miller also goes over into the region of Freudian psychology in analyzing Verne in terms of "lengths of telesopes," "diameters of holes" etc.

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

Not every reader likes Verne or enjoys the enormous details he puts into his stories. Still, the reader deserves the complete Verne. If you can't buy it for your own collelction, make sure your library gets a copy. Crowell and Professor Miller should be encouraged to continue and give us more of the definitive Verne.

During 1978, the French government to honor the 150th anniversary of Jules Verne's birth, invited Mr. and Mrs. Ray Bradbury to travel to France to partake in the celebration. We, in the United States of America, did nothing. Such is the high prestige of science fiction in modern America.

The stature of Jules Verne among most modern readers of science fiction is relegated to two facts: (1) the works of Verne can be found in most libraries and (2) Hugo Gernsback started off magazine science fiction with the April 1926 issue of *Amazing Stories* which he filled with reprints of Edgar Allan Poe, H. G. Wells and Jules Verne. After running out of reprints, Gernsback started to use new original stories.

Let's dispose of fact #1 first. I've been in hundreds of libraries, big and little in all parts of the country and outside of the very large university or metropolitan libraries, only two Verne titles seem common, *Twenty Thousand Leagues Under the Sea* and *Michael Strogoff.* Since Verne wrote sixty-four books, his availability in English seems very limited.

Fact #2 seems accurate because so few people have taken the trouble to examine the older magazines. The issues are available in microfilm at nominal cost and the number of complete sets of the Gernsback *Amazing* is fair. The lack of exact knowledge is puzzling. The Gernsback *Amazing* consists of those issues edited and published by Hugo Gernsback totaling of thirty-seven issues dated April 1926 through April 1929. Gernsback started using new stories with the third or June 1926 issue. He also used seven stories by Jules Verne spread over twelve of the thirty-seven issues. They consist of the two short stories, "Dr. Ox's Experiment" (8/26) and "A Drama in the Air" (11/26) and five novels *Off on a Comet* in two parts in April 1926, *A Trip to the Center of the Earth* in three parts in May 1926, *The Purchase of the North Pole* in two parts in Sept. 1926, *Robur the Conqueror or the Clipper of the Clouds* in two parts in December 1927, and *The Master of the World* in two parts in February 1928. Considering the many books Gernsback did not reprint, it is pretty obvious that Gernsback had merely dipped into the works of Verne.

Other editors of *Amazing,* after the departure of Gernsback printed additional stories by Verne. Editor A.H. Lynch published *The English at the North Pole* in two parts in May 1929, and *The Desert of Ice* in two parts in June 1929. Editor T.O'Conor Sloane published "The Watch's Soul" (12/33) and *Measuring a Meridian* in four parts in May 1934 and in the fall 1934 *Quarterly, A Winter Amid the Ice, or The Cruise of the Jeune-Hardie.*

Don Wollheim published two shorts by Jules Verne in his *Saturn Science Fiction and Fantasy,* "Eternal Adam" (3/57) and "The Ordeal of Dr. Trifulgas" (7/57). Two other Verne short stories appeared in the

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

Magazine of Fantasy and Science Fiction. "Gil Bralter" (7/58) and "Fritt-Flacc" (11/59).

These few paragraphs should indicate how relatively few Verne stories have appeared in the English language science fiction magazines of the last half-century. It is *not* a terribly long list when you consider that Gernsback managed to get a story or part of a story by H. G. Wells into thirty out of those thirty-seven issues. In fact, there was something by Wells in every issue from April 1926 through to the August 1928 issue.

Hopefully we have managed in our own humble way to honor the immortal spirit of Jules Verne, a giant of science fiction and to indicate his exact importance in our magazine science fiction heritage.

Joe Haldeman's anthology **Study War No More** (Avon $1.95) consists of nine stories and one essay. The essay is by Isaac Asinov, and is not too meaningful, in my opinion. Haldeman's own story, "To Howard Hughes: A Modest Proposal" seems a bit weak. If you have the money to build the technology to build small atomic bombs, why not go direct to the cause of the problem and bribe the politicians? Ben Bova's "The Dueling Machine" certainly cuts down on the casualties. It refers us back to a time when battles would be settled by hand-to-hand combat by champions while the armies sat down and watched. Mack Reynolds "Mercenary" is an advanced state of gangsterism. It does not follow von Clausewitz's definition of war as a continuation of state policy by other means. Two commercial companies battling each other by means of independent armies seems more like a replacement of the entire legal system. Poul Anderson's "A Man to My Wounding" would certainly cause a large increase in the double business.

Harlan Ellison's "Basilisk" is the most emotional of the selections in the book and graphically shows the depth of man's inhumanity to man.

All the selections are worth reading and thinking about. If Joe Haldeman could maintain this level of sensitivity in his selections, he could become a name to reckon with in the anthology field.

General Robert E. Lee once said, "It is a good thing war is so bloody, otherwise men would grow to love it too much." War has many faces and meanings and certainly the alternatives to war will be equally nonsimplistic. it is both a snare and a delusion to believe that complicated problems can always be solved by simple methods.

Haldeman's book is highly recommended.

Surely, somewhere, someone must weep for all the trees cut down to produce paper to print Robert E. Mills **Star Force** (Belmont Tower $1.75). What is more astounding is that this is the third book of a series, *Star Quest, Star Fighters.* Line them up/Bad guys—The Dark Emporer Ylang, Ylang (no I'm not kidding), his steward Blorg the Devastator and Quaarg the Destroyer who wants to take Blorg's place (I don't know why either!). Now the good guys who wear white hats: the warrior-mystic, Garthane, Red Rian, Lady Nila and Dann Oryzon. I leave it to the dear reader to figure out what happens to this many

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

layered masterpiece of awful science fiction. Reviewers have to waste their time so that readers can save their time for worthwhile books. The cover of the book is passable. I think this type of material was what Ben Bova and Harlan Ellison were talking about when they complained about *Star Wars*. It was about all the stupid contemptable imitations of *Star Wars* that would deluge us. Intellectually, SF is headed for a new darker dark age. Avoid at all cost. It isn't even good fun.

Mack Reynolds, **Brain World** (Leisure Books $1.75) is acceptable light reading but nothing to go out of the way for. The planet Einstein applies for membership in the United Planets and Ronny Bronston goes to investigate. The planet seems a paradise, almost without government, but it seems that Bronston knows the location of Dawnworld, where the inhabitants know about eternal life and matter duplication. So the planet Einstein contains a few who would add the benefits of dawnworld to Einstein.

Even the best writers take a holiday and this is lesser Reynolds.

Gordon R. Dickson's **Pro** (Ace $1.95) is expanded from the September 1975 Analog. This is one of the Ace Illustrated Novels, James Odbert being responsible for the interior illustrations and Benvenuti for the cover. My artistic knowledge is pretty bad and I hate to judge material outside my particular expertise. I did not find the illustrative material much of an asset in this book. Perhaps another artist in another book will strike me in a more positive fashion. I could take them or leave them without much of an impression in this book.

Bill Cohone of the Expansion Service has been on world 49381D for ten years. He has been following the Expansion Service plans to the letter and has a genuine affection for the intelligent but nonhuman Homskarters who inhabit the world. In comes the hyper-ambitious sector chief, Harb Mallard who is a *profe*ssional xenosociologist and dislikes the unprofessional do-gooders like Cohone. Mallard has his own ideas about speeding up the plan to lever himself even higher into the leadership of the Expansion Service. He does not lack courage but he does lack compassion.

I think Dickson manipulates his persona in much too convenient a fashion for the book. If the chief of the Homskarters is killed when he is successful, what would happen if he were unsuccessful? Also if Mallard is successful in his tasks by using magic, it would take a very high order of bravery to oppose him. The book illustrates the basic organization problem of insuring that everyone in his niche is fulfilling the plan according to the plan.

The book is recommended but somehow one feels that Gordon Dickson could have made this book into a much better book.

I wish to make some comments about the flood of new reference material about science fiction. Many of these books are very helpful to the new scholar but do little or nothing for the old timer who is looking for new and very much stricter guidelines of scholarship to be promulgated so that many of the errors that have worked their way into the references can be

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

eliminated. Also, the physical appearance of many of the books and their contents need vast improvement. One can go blind looking at badly designed computer printouts that are called books because someone has bound them up in hardcover.

Let me point out the recent and ably done William Contento **Index to Science Fiction Anthologies and Collections** (G. K. Hall ($28.50). This is a followup to Walter R. Cole's **A Checklist of Science-Fiction Anthologies** which covered the field to the early 1960s. Both books index stories by author and title and also list the various anthologies a story may have been in. Also the source ,(i.e. original appearance of each story) for each story is listed. For some reason, Contento's computer is unable to put down the date of weekly periodicals and so you can only get the month and year say of a particular issue of *Argosy* that might be the source of a story. For the exact weekly date I guess you just guess. Cole, working in a more primitive time without a computer is not hampered by this scientific advance.

Both authors obviously have many errors and omissions in their books, but that is the name of the game in these large accumulations of facts. I should not like to weary the reader with long lists of errors. It makes for dull reading and doesn't really solve the problem.

However, just to show you there are some problems, if the reader checks the August 1927 *Amazing Stories* looking for the source of Julian Huxley's "The Tissue-Culture King," he will find information that indicates it is reprinted from the *Yale Review*. Also, J. T. Rogers' story "Beyond Space and Time" in the September 1950 issue of *Super Science Stories* has a notation that it is a reprint. It is reprinted from the March 1938 issue of *All-American Fiction*. Material like this is for the nit-picking collectors. It can be a very interesting game if one has a decent collection of magazines.

When I started out collecting magazines, an old collector once told me that one should take nothing for granted but check, check and double-check. He meant to check the magazines. If one doesn't, one can get into a fair bit of trouble. For example, a well known magazine index will tell you that Algis Budrys once did a cover for the magazine *Plant Stories*. Budrys is a fantastic writer but I never suspected him of being an artist. Yes, the issue does indicate Budrys as being the cover artist of that issue but the next issue corrects the mistake. Gentlemen, keep in mind, behind every stupid computer mistake is a stupid himan being helping the computer make the mistake.

I'm not looking down at data accumulators, we always need accurate data in as legible a format as we can devise. Simple typographical errors, are always with us. I mentioned the above business about Huxley and Rogers' stories simply because Cole had missed them and now fifteen years later, Contento repeats what Cole did. Surely, there is someone who has heard of the old fashioned doctrine of checking the originals? Both of these looks are useful (though the Contento is more up to date). However we need more accurate research and a higher standard of scholarship to clarify our history. ■

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

brass tacks

Here are two letters on earlier articles...a bit late, perhaps, but with food for thought still timely...

Dear Sir:

I am a scientist who has watched with growing concern while the technical superiority of the United States over the rest of the world has disappeared. I, too, have been alternately amused and offended by the Luddite foolishness of Senator Proxmire.

Nevertheless I must defend the good senator and vehemently disagree with the proposition of the article by M. David Stone in the March Analog. Science is not theology; technology is not religion; the practice of science of technology is not a "calling," a priesthood, something to be supported by a laity with fear and trembling.

A scientist determined to "do his own thing" is of course free to do so provided, like Darwin, he has independent wealth or provided like Einstein, he will accept a menial job for subsistence. A scientist who wants expensive playthings, be they particle accelerators or round trip tickets to Machu Picchu, had better prepare to pander to Mammon because it is, and should be, still true that "the one who pays the piper calls the tune."

It is a straightforward transaction to seek funds from an industrial concern ("This may be profitable!") or from a private foundation ("It's for the good of your favorite charity."). When one seeks money from government, everyone's money is at hazard and part of the responsibility of the (supplicant is to inform, sell, defend, justify and excuse the requested funding. Basically, Senator Proxmire is merely a representative spokesman for Joe Common Man; if I can't convince Senator Proxmire that my proposal is worthwhile, then I have no claim to wisdom, virtue, insight, or grace to fall back on—I don't deserve the money.

Sure, there's a problem with the financial support of science in America today. But the problem is not the stinginess of government; government is spending 110% of its income every year on a spectrum of foolishness. The overwhelming problem is that we scientists, secure in the conviction of our innate superiority, have forgotten that we must "sell" science to the nation. Senator Proxmire may be vocal, but he thinks and acts much like the body politic; if we want public funds, we should be ready, willing, and able to convince him of the "worthiness" of entrusting us with the public's money.

Gordon R. Love
34 Holly Lane
Williamstown, Mass. 01267

Dear Stan:

Enjoyed your Editorial, "Servant's Pay," in the May *Analog*. May I add a suggestion to your excellent proposal?

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

One of the reasons given by our "public servants" in the Congress for their escalating salary needs is that they must maintain a household in Washington as well as in their home constituency. Despite the expense allowances they vote themselves, the Representatives and Senators claim that this double-housekeeping problem is *very* expensive—especially when you consider the amount of social entertaining they must do.

To a certain extent, I agree with them. My wife and I maintain two households, and it is indeed quite expensive.

But why shouldn't our "public servants" in the Congress be treated the way other civil servants are? That is, they should be put up in Government-owned quarters, rather then be forced to buy houses in the Washington area. The quarters need not be squalid, but neither should they be luxurious houses in elegant suburban neighborhoods. They could be built right in downtown Washington, D.C.—or perhaps be obtained by converting existing hotels, apartment buildings, or housing developments.

This would save a lot of money for our Represenitives and Senators and, if done honestly, would probably save a fair amount of tax dollars for the rest of us.

Any politician who isn't willing to live in Government furnished quarters ought to be examined rather carefully by the voters.

Why not write to Senator Proxmire, who so zealously guards our tax money, and ask hium to spearhead such a campaign?

Ben Bova

P.S. Maybe we could also convince our Representatives and Senators to eat at government cafeterias while in Washington. More savings!

Omni
909 Third Ave.
NY, NY 10022

Hear, Hear!

Dear Stan:

I received the April issue today and immediately sat down and read all the non-fiction because it all looked so flat-out fascinating. It was, indeed. While I have felt that recent issues contained a bit too much non-fiction, this one is a gem. But before I get into that, let me remark that this issue appeared in my mailbox a full week after its appearance on the local news stands. I was going to complain that until this year, t'was the other way around, but there's obviously nothing anyone at your end can do about it. The same mailbox contained two separate issues of SCIENCE, and last week I got a copy of SCIENCE NEWS that was three weeks in arrears of issues that I'd already received. Where is Peirce's "Chap Foey Rider" when we really need him?

Onward. Absolutely loved your editorial, but then, of course I would since I've been there in "Liberal Education" land too. While my views about "my" former college are less sanguine then your views about "yours," since I didn't leave "mine" voluntarily, the editorial doth truly hit the peg squarely. Of two former colleagues and still staunch close friends, one teaches English and can't find his way to a wall socket without help. The other is a math prof who's a fair amateur Chinese historian and who teaches non-credit

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

courses in the mystery novel. Ah yes, nice editorial! For what it's worth, the current hot faculty debate at "my" college concerns changes in the catalog to read his/her and chairperson from the former chauvinistic language. I've pointed out to my friends that, once again, they're being shortsighted and are failing to note future trends with regard to Gay Lib and transsexuality: obviously the only appropriate pronoun change should be "s/h/it."

Next goodie. Who the hell is this George W. Harper and why is he so wonderful? I swear "Build your own A-bomb..." is the funniest thing I've read in a long time and if I can stop laughing long enough, I'll send Ralph Nader a copy with a map of his anatomy so he'll know what to do with it. Oh my, what a beautiful article, and all the more joyous for its closeness to the plot of Lawrence Dunning's recent and horrible novel, KELLER'S BOMB. I thought about reviewing Dunning's BOMB for Dick Geis, but this "non-SF" novel is so stupid that it's not even worth a killer review. Although I think that Harper cheated a bit on a few of the numbers, he's got the right order of magnitude all the way through, and it's such a treat to clearly see why the FBI will have not trouble finding all those terrorists who glow in the dark. Please thank Harper for me; biopsychologists appreciate fun physics too.

H'mmm. Don't quite know what to do with Janifer's book review. I don't own an HP-65 and am unlikely to spring for the cost of INFORMATION MECHANICS, so I'll just have to wait and see—hopefully "Brass Tacks" will heat up on the subject. I really try to keep an open mind every time the universe is re-structured, but it's hard, even after I checked to see that there really is a physicist named Polykarp Kusch (well, hell, us biopsychologists don't know everything and the only Nobel laureates I've met had names like Walter and Linus), to take this Kantor seriously.

Huh, oh yeah. Well, as for the fiction in the April issue, I'll get to that any day now, really I will. But that brings up my answer to your question: no. I'll pass on the return of a monthly AnLab. Never voted before and probably won't in the future. Sample size is too small (I know, I know, with that attitude, it's a self-fulfilling prophecy). Don't vote for the Hugos either; same non-reason plus the Hugo ballot costs too much. I do vote in the LOCUS poll though, as the sample size is a little larger there and Charlie Brown gives me a free issue (is all this beginning to make sense?). Also send in the OMNI polls as they're postage-paid (I'm not trying to tell you what to do if you want to do it right, mind you). Frankly, when you consider what the lobotomy patients who run the TV networks do with the output of that statistical conman Nielson, you ought to worry a lot about an AnLab based on less that a thousand votes. Then again, once those nice Conde Nast folks spend the $5 million on advertising, the circulation will be up there with OMNI and AnLab numbers will take care of themselves.

Speaking of the competition, it seems to be getting smaller. Haven't seen a GALAXY in four months... got 20 years worth on the bookshelf too...sigh. You and Scithers may soon be all alone in the digest-pulp

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

tradition and that will hurt because there's strength in numbers on the news stands.

All the best,
Dr. Dean Lambe

Dear Mr. Schmidt:

Having read "Build Your Own A-Bomb" by George Harper as soon as the April issue arrived, and being a dedicated, not to say fanatical, transnational terrorist of fabulous wealth and resourcefulness, I immediately set out to make a *really big* mark on the world. In short order I had acquired a suitable building in which to construct the bomb, stolen five tons of reactor-grade uranium (so cleverly, I might add that the victimized power stations will *never* be aware of their loss), and put together a state-of-the-art gasseous diffusion plant. It was then that I ran into a problem which I have been quite unable to solve and which bids fair to make all my investment for nought. *No*where can I find even sixty ounces, let alone sixty tons, of hydroflouric acid. Worse, my friends in Chemisty have never even heard of it. Could author Harper, or some Analog reader, help? Perhaps if I tried hydrating flour....

Simon Edkins

Sorry—we slipped. We'll always try to catch things like that before they get into print, but once in a while they're too fast for us. We'll try not to let it happen again.

Dear Mr. Schmidt:

I wish to respond to M. David Stone's article *Funding The Future.* I find the activities of the NSF among the least odious of those to be found in the Federal sphere. Nonetheless, it is not the proper function of government to decide what is basically a market function to decide; that is, how are the resources of a free individual to be apportioned.

It is a common fallacy among the members of the Academy that basic

CONDÉ NAST BOOKS, P.O. Box 3308, Grand Central Station, New York, N.Y. 10017
Yes, please send me:
_____ copies of ANALOG YEARBOOK
@ $5.95 plus 65¢ postage and handling—total $6.60
_____ copies of THE BEST OF ASTOUNDING
@ $5.95 plus 65¢ postage and handling—total $6.60
I enclose my ☐ check or ☐ money order for $ _____. If for any reason I am not delighted, I may return the book(s) within 10 days for a complete refund. Please make your check payable to CONDÉ NAST BOOKS.
Name _____
Address _____
City _____ State_____ Zip_____
Please bill my ☐ American Express ☐ Visa ☐ Master Charge
Card number _____ Expires_____
Signature _____

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

research would not be provided for in the absence of federal funding. There is no way to predict how much money would go to basic research if 42¢ of every dollar earned by Americans was not pre-empted by taxes. Despite this percentage of our resources stolen from us, there is a great deal of privately funded basic research in this country. It is unfair that the taxpaper should fund that which will ultimately benefit large corporate entities such as IBM, Dow Chemical, and General Robotics; and should be required to fund it under the threat of force. (Anybody who doesn't think it is done by by force should try to deduct from their taxes that which they don't approve of the government spending. Ask Joan Baez.)

Further, there are serious problems with allowing the government to decide how money is to be spent. Stone said it well. *Who should be in charge.* As long as the government is doling out the money, the decisions will be largely political. Whoever has the noisiest special-interest group will get the most attention. Therefore more money is wasted on the lobbying and political pork-barreling that will always precede the actual grant. Since federal money is 'free', there is a tendency to design cost-no-object systems to accomplish a given end. As an example, Otrag, a privately funded West German company operating from a leasehold in Zaire, will be putting materials into orbit beginning late next year at 5% the cost of NASA's efforts. In short, the economics are bad and the priorities are distorted.

I would expect that the most gifted people of our society have the greatest stake in a free society. It is they who should be seeking the Society by Contract in lieu of the Society by Force.

James Gallagher
P.O. Box 1078
Sunset Beach, CA 90742

Dr. Schmidt:

I have been following with interest the articles about Senator Proxmire and his Golden Fleece Awards in Analog and agree completely. I am a research chemist in private industry and the opinions of my co-workers, most of whom read science fiction, about Proxmire can not be repeated. It is unfortunate that committee seats are won on the basis of seniority and political power rather than knowledge of the subject of the committee. Since Proxmire is unable to understand the difference between basic and applied research and the necessity for both, he is the last person who should be overseeing areas such as NSF or NASA. Committees in these areas should be chaired by congressmen with solid backgrounds in the sciences who can understand what they are voting on. Since Proxmire has a platform for all of his statements, it is harder for responsible scientists to get the truth to the general public in a way they can easily understand. Analog is the perfect bridge between scientists, many of whom are SF readers, and the general public by way of the Analog reader who is better able to understand science than the general public. Keep up the good work of exposing people who are trying to drive a wedge between science and the people.

Joseph Pialet
26151 Lake Shore
Euclid, Ohio 44132
We'll try.

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

STARFLEET ORION

An Adult Strategy Game for use with Home Microcomputers -

The man called Sudden Smith watched the five blips on his screen spread out to meet the enemy. Two freighters converted into something like battlewagons, powerful but slow, and three real cruisers: the most powerful group of warships ever seen near the Promethean system - except for the Stellar Union fleet opposing them. Everyone was calling it Starfleet Orion, though it existed for only this day. It was life or death, and after the object lesson on the planet Spring, everyone knew it.

STARFLEET ORION is a complete game system. It transforms your TRS-80, APPLE, or PET computer into the Starfleet command console. Now you can become part of the story. Maneuver your star squadrons where you will. The computer moderates the game, handles the rules, and performs all of the calculations that would *otherwise* make the game quite complex. As it is, you can sit down and begin play in minutes.

STARFLEET ORION brings you 12 games in one! There are 12 different scenarios, ranging from one on one Starship encounters to massive planetary assaults. Each scenario has its own fictional introduction, together constituting the history of the war between the Stellar Union and the Orion colonies. What's more, you can create your own scenarios, so the game is infinitely expandable. And all this with *No Knowledge of Programming Required*!

STARFLEET ORION includes

- Program Cassette
- Rulebook
- Battlemanual
- Ship Control Sheets
- Program Listings

Send check or money order to:
Automated Simulations
P.O. Box 4232
Mountain View, CA. 94040
Send:
STARFLEET ORION:

☐ TRS-80, 16K, Level II	$16.95
☐ PET, 8K	$16.95
☐ APPLE, 16K	$18.95

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

MUSIC TO READ SF BY

Music guaranteed to send the imagination soaring. Music to take you into the same exciting new dimensions of time and space offered by writers like Heinlein, Asimov, and Clarke. Including film scores from such movies as *Fahrenheit 451*, this superb stereo recording is a $4.95 value. Now it is available exclusively to members of The Science Fiction Book Club at a big 40% saving – yours for just $2.95 when you join.

How the Club works:

When your application for membership is accepted, you'll receive your introductory package of 4 books for just 10¢ plus shipping and handling. (If you also want the record, check the appropriate box in the coupon below.) If not completely satisfied, you may return them within ten days – membership will be cancelled and you'll owe nothing.

About every 4 weeks (14 times a year), we'll send you the Club's bulletin, describing the 2 coming Selections and a variety of Alternate choices. If you want both Selections, you need do nothing; they'll be shipped automatically. If you don't want a Selection, or prefer an Alternate, or no book at all, just fill out the convenient form always provided, and return it by the date specified. We allow you at least ten days for making your decision. If you don't get the form in time to respond within 10 days, and receive unwanted books, you may return them at our expense.

As a member you need take only 4 Selections or Alternates during the coming year. You may resign any time thereafter, or remain a member as long as you wish. At least one of the two Selections each month is only $2.49. Other Selections are slightly higher but always much less than Publishers' Editions. A shipping and handling charge is added to all shipments. Send no money. But do send the coupon today.

ANY 4 BOOKS FOR 10¢ with membership

BONUS: Also take, if you wish, this $4.95 record value – now available exclusively to club members for just $2.95!

0075 **The Chronicles of Amber.** By Roger Zelazny. At last — the Amber series is complete! Two glorious volumes contain: ***Nine Princes in Amber; The Guns of Avalon; Sign of the Unicorn; The Hand of Oberon; The Courts of Chaos.*** Comb. pub. ed. $30.30

4697 **The Fountains of Paradise.** By Arthur C. Clarke. Important new novel by one of the superstars of science fiction. Pub. ed. $10.00

2543 **The Dragonriders of Pern.** By Anne McCaffrey. A mammoth volume containing all three novels: **Dragonflight, Dragonquest** and **The White Dragon.** Comb. pub. ed. $26.85

5207 **Titan.** By John Varley. When a ship is snatched from space, the crew finds itself in an alien world – *inside another space ship.* ***Explicit sexual content may be offensive to some.*** Pub. ed. $9.95

4721 **Brother to Demons, Brother to Gods.** By Jack Williamson. Humans may become extinct – supplanted by races *they created themselves!* Pub. ed. $10.00

1040 **The Avatar.** By Poul Anderson. *Daring men and women brave the unknown potentials of an alien transport machine* — and discover more than expected! Pub. ed. $10.95

7831 **Galactic Empires.** Brian Aldiss, ed. Two-volume anthology of 26 stories by famous authors Clarke, Asimov and others covers the Rise and Fall of Galactic Empires. Comb. pub. ed. $17.90

4945 **Leviathan's Deep.** By Jayge Carr. When another race tries to use a Terran in their power play, the Terrans take a hand in the game. ***Explicit sexual content may be offensive to some.*** Pub. ed. $8.95

4754 **The Book of Morgaine,** By C.J. Cherryh. Exciting 3-in-1 volume contains **Gate of Ivrel, Well of Shiuan,** and **Fires of Azeroth.** Special edition.

6221 **The Foundation Trilogy.** By Isaac Asimov. The ends of the galaxy revert to barbarism. An SF classic. Comb. pub. ed. $20.85

8532 **The Hugo Winners, Vol. I & II.** Giant 2-in-1 volume of 23 award-winning stories, 1955 to 1970. Asimov introduces each. Pub. ed. $15.45

4523 **Stardance.** By Spider and Jeanne Robinson. A dancer's art opens the way to communication with aliens. Pub. ed. $8.95

Science Fiction Book Club

Dept. UR052, Garden City, N.Y. 11530

Please accept my application for membership in the Science Fiction Book Club. Send me the 4 books whose numbers I have indicated below, and bill me just 10¢ (plus shipping and handling). I agree to the Club Plan as described in this ad, will take 4 more books at regular low Club prices during the coming year and may resign any time thereafter. SFBC books are selections for mature readers.

☐ Send me, in addition, GREAT SCIENCE FICTION FILM MUSIC and bill me just $2.95 plus shipping and handling.

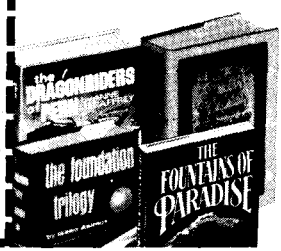
Mr.
Mrs. ___
Miss
Please print

Address ___ Apt. ___

City ___ State ___ Zip ___

Order not valid without signature. If under 18, parent must sign.

The Science Fiction Book Club offers its own complete hardbound editions sometimes altered in size to fit special presses and save members even more. Members accepted in U.S.A. and Canada only. Canadian members will be serviced from Toronto. Offer slightly different in Canada. 51-S140



LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED